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Books.—We will forward by express, at publisher's lowest rates, any book—scientific or otherwise—to any address in the United States or Canada. We would suggest to our patrons that to avoid the risk and expense consequent on sending us the money (we do not send books C. O. D.), that orders for books be sent us through the Purchasing Department of the American Express Company.

The Public Lighting Tables of the American Meter Company will be found in the page advertisement of that Company.

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[OFFICIAL NOTICE.]

Seventh Annual Meeting, Wisconsin Gas Association.

WISCONSIN GAS ASSOCIATION,
OFFICE OF THE SECRETARY,
RACINE, WIS., April 21, 1908.

To the Members of the Wisconsin Gas Association: The seventh annual convention of this Association will be held in Milwaukee, Wis., on Thursday, the 14th, and Friday, the 15th, days of May, next. Headquarters will be in the Hotel Pfister. Inasmuch as the Public Utility Companies of the State are now under the supervision of the Railroad Commission of Wisconsin, the session will be largely devoted to matters pertaining to this subject.

Respectfully yours, HENRY H. HYDE, Secy.

[OFFICIAL NOTICE.]

Wrinkle Department, American Gas Institute.

To the Members of the American Gas Institute: All members of the Institute are earnestly requested to send in as soon as possible contributions for this year's Wrinkle Department report. The success of the Department depends entirely on the co-operation and assistance of the members.

Mail all contributions to Milan R. Bump, Editor, No. 60 Wall street, New York city.

[NOTICE.]

Third Annual Meeting, Natural Gas Association of America.

OFFICE OF THE SECRETARY,
KANSAS CITY, MO., April 6, 1908.

To the Members, Natural Gas Association of America: Gentlemen—The third annual meeting of the Natural Gas Association of America will be held in Kansas City, Tuesday, Wednesday and Thursday, May 19th, 20th and 21st. The following papers will be read:

"Geology Relative to Natural Gas," by Mr. F. H. Oliphant.

"Transportation of Natural Gas," by Mr. Wm. M. Welsh, Chief Engineer Kansas Natural Gas Company, Independence, Kas.

"Method of Distribution Management," by Mr. James Strickler, City Superintendent, Columbus, O.

"Field Operation," by Mr. Walter McClay, General Superintendent, Philadelphia Company, Pittsburgh, Pa.

"Methods of Accounting," by Mr. W. R. Hadley, Pittsburgh, Pa.

"Installation of Distribution Systems," by Mr. John B. Klumpp, U. G. I. Company, Philadelphia, Pa.

Other papers, the Question Box and Wrinkles, are in the course of preparation, and announcement of the titles of the papers will be made later.

SMITHSONIAN DEPOSIT. MAY 11 1908

For the entertainment of the delegates outside of the business meetings, arrangements are in the hands of an Entertainment Committee for visits to various parts of this very interesting city, and for a banquet on Thursday night. There will also be trips of interest; and a theater party for the ladies. The business meetings and the banquet will be held on the roof garden of this hotel. It is suggested that reservations for rooms be made at as early a date as possible.

It has also been determined to take the entire ground floor of a building immediately south of the Savoy Hotel, which will be the headquarters of the Association for the purpose of demonstrating various appliances for using natural gas.

This room is large, well lighted, well ventilated and readily accessible, not only to the members of the Association, but also to the public. As the building is piped the various appliances exhibited can be shown in actual operation. Manufacturers of appliances wishing to make a demonstration thereof may obtain any necessary or desired information concerning this display by applying to Mr. R. O. Fritz, 2012 Baltimore avenue, Kansas City, Mo. Yours very truly,

J. H. DUNKEL, Secretary.

BRIEFLY TOLD.

OBITUARY NOTE, CHARLES H. NEWHALL.—Although not widely known to the gas fraternity, mainly through his desire to go on in the ranks of those who labor forcefully and successfully, but unflauntingly, it seems fitting that something of the history of a man who had done much for the lighting industry of this country, especially of the New England section, should be detailed in the JOURNAL. The subject of this short sketch is Mr. Charles H. Newhall, for many terms President of the Lynn (Mass.) Gas and Electric Company, who died at his home in that city the morning of April 22d. His death was the result of an affection of the lungs, the starting point of his illness being traceable over a period something in excess of three months. He was born in Lynn 62 years ago, and within its limits was always his dwelling place. He saw his native city grow from a rambling, rather disconnected place, to a populous city, abounding in life, order and wealth, and much of its advancement was abetted by him through active work and wise counselling. And right here it seems fitting to remark that, as was his course in connection with the artificial lighting industry, so was his course in the upbuilding of Lynn. Many times requested to take on civic honor through commanding position in office, he steadfastly declined. Not that he was not active in shaping the policies of the government of Lynn, and even well beyond its limits, but his was the activity of the planner and the potential helper. Born in circumstances that required no exertion on his part to gain him place and position (his father, the late Henry Newall, also born in Lynn, was really the most prominent financier and business man of that city for many years), in early youth he went through the educative routine that the sons of wealthy parents usually do, and eventually graduated from the Chauncey Hall School, Boston. Even as a student he manifested those traits which accompanied his course through life. His first active business connection was with the Keene Brothers, in their day the leading shoe manufacturers of Lynn. About 1872 his father, owing to an illness that prostrated him but that did not terminate fatally until 1878, retired from business, and the subject of this sketch succeeded to the custody and direction of the father's vast and varied interests. To enumerate the many financial and other enterprises with which he was connected would be quite like naming everything that was prominent and best in his native city. Nor was he indolent in his connection with those affairs of magnitude; to the contrary, he was active and solicitous on such behalf. Perhaps, though, his greatest part of time and share of attention were given to the affairs of the Lynn Gas and Electric Company, of which sterling corporation he was President since 1883. That he listened to the wisdom of his trusted advisers is shown well in the fact that the plants of the Lynn Gas and Electric Company are of the most approved modern types; that none in New England or elsewhere are better adapted for the service they are called upon to perform. A prominent Lynn daily newspaper, in an extended obituary mention of deceased, had this to say respecting his administration of the Company's affairs: "During his administration that corporation has steadily grown in strength and equipment, and his policy of always keeping near the people and raising no barrier which might result in dissatisfaction has been largely responsible for the unique position the Lynn Gas and Electric Company has successfully maintained in these days when it is the temper of people to assail such concerns." If deceased, however, would not accept actual political preferment it is nevertheless true that he served his city as City Hall Commissioner, City Debt Sinking Fund Commissioner and in other sensible ways. Naturally one would look to see his name prominent in connection with the public and private charities of Lynn. And it was. He was particularly interested in the Lynn Hospital—he was its Vice-President since 1899—was Vice-President of the Home for Aged Women, and held a like post in connection with the Home for Aged Men. He was Vice-President of the Lynn Board of Trade, of the Lynn Free Public Library and of the Lynn Historical Society. But the naming of the various institutions with which he was actively identified is of no particular avail here. Suffice it to say that they were many. His social life was naturally of the highest type, and it is regrettable that no direct issue survives him. Although twice married, he has been a widower for several years. A sister (Mrs. Benjamin Perry, also a resident of Lynn) survives him. The funeral ceremonies were held Saturday, April 25, and the throngs that assisted in them, at home, in the church and at Pine Grove Cemetery (in the development of which beautiful place of sepulture he had so successfully labored), well attested the hold that he had upon the residents of Lynn. Well-known and obscure, rich and poor, capitalist and workman, all paid that homage to the deceased that is paid by those who esteem their dead.

CURRENT COMMENT.—

A GLANCE at the official notice of the meeting this week of the Wisconsin Gas Association will show that the time for calling the sessions has been set back one day.

WE are in receipt of the Twenty-third Annual Report of the Massachusetts Board of Gas and Electric Light Commissioners. Quite like its predecessors it is complete; in fact we believe that the current volume surpasses, in its content of interesting and valuable matter, any of those that preceded it. The forms of the tables have been improved, and the compiling has been done with exceeding care. Notable in the appendix contents is the report of the action taken by the Board in respect of the direction of the Legislature that the "Board provide for an investigation and report of the equipping of gas fixtures with self-closing devices." We expect to print a lengthy review of the Report in a later issue, and take leave of it here by remarking that a copy of it should be in the possession of every gas company in the land.

DOCTOR F. E. TURNEAURE, Dean of the College of Engineering, Madison, Wis., asks us to call the attention of our readers to the fact that the Artisan and Engineering Summer Schools conducted by the University of Wisconsin, will be carried on this year as they were carried on last year. The sessions are scheduled to commence June 22d and will continue for 6 weeks. Those interested in the matter may obtain all the required information by addressing Dean Turneaure, as noted above.

UNDER the announcement recently made by Mr. W. McLea Walbank, Vice-President of the Montreal (Can.) Light, Heat and Power Company, the net selling rate until May 1, 1909, shall be $1.10 per 1,000 cubic feet. After that date it is to be reduced to $1.

THE 48th annual meeting of the German Society of Gas and Water Engineers will this year be held in Berlin, from June 15th to 19th, under the Presidency of Mr. J. Notte, General Director of the New Gas Company, of Berlin. While the programme is not yet completely arranged, the outing schedule so far made up includes: Monday afternoon, a visit to some of the leading industrial establishments of Berlin, with a formal reception arranged for the evening. On Tuesday afternoon a visit will be made to the magnificent new municipal gas works at Fiegal. On Friday morning visits to some of the noted technical works will be made, and in the afternoon a social excursion will be brought off.

The Peoples Gas Light and Coke Company, of Chicago, has contracted with the Kerr Murray Manufacturing Company, of Fort Wayne, Ind., for the installation at its Twenty-second street Station of 4 cast iron purifying boxes, 30 feet by 42 feet, by 12 feet deep, with water seals. The contract includes the Kerr Murray multiplex type of valve system connections, floor carriages, supporting beams and columns. The connections are to be 30 inches diameter.

THE Cairo City (Ills.) Gas Company has much reason for congratulating itself over the success of the series of demonstration lectures recently conducted at its instance. The lecturess was Mrs. J. D. Gibson.

THE condensing and purifying plants of the Glens Falls (N. Y.) Gas and Electric Light Company are to be reconstructed. The contracts in connection therewith have been awarded.

[Official Report.—Continued from page 756.]

FOURTH ANNUAL MEETING, ILLINOIS GAS ASSOCIATION.

Held in the Auditorium Hotel, Chicago, March 25 and 26, 1908.

First Day—Afternoon Session.

Something Regarding a Kindred Association.

The President—We have with us this afternoon the Editor of *Light*, who is also Secretary of the National Commercial Gas Association, Mr. Lucius S. Bigelow; and if he will tell us about the work being done by the Association, I am sure we will be glad to hear from him.

Mr. Bigelow—This is certainly an appropriate time to speak on commercial matters, since there is so much commercial this afternoon on your programme. Regarding the Commercial Gas Association, which was formed a matter of 3 years ago, I should like to say a word, I am exceedingly obliged to you for giving me this opportunity, because that Association has, in the minds of some people, seemed to occupy the position of a competitor of some other associations. That idea is gradually, or rather, very rapidly disappearing. The National Commercial Gas Association was formed to specialize in the field of gas, with a view to creating possibly ways and means, or at least to assist in so doing, for selling, as the slogan goes, "Millions of feet of gas, where thousands are sold to-day." The Association was formed in New York. The name was given to it of National Commercial Gas Association, because the purpose was to make it a "National" Association, not an "Eastern" Association, nor a local association in any section of the country; one not limited geographically in any way, shape or form. We have been asked why, since the name "National" was attached, we have held three meetings in New York, and none elsewhere. Simply this. We have been in existence about 3 years. No, that is not so; we have been in existence in reality for only about 2 years. But we have held three meetings. Our first regular annual meeting was held in New York, January, 1906. Then a year passed and we had our meeting of January, 1907, when we held an exhibition of gas appliances in New York city; a meeting that was eminently successful as a meeting, an exhibition that was eminently successful as an exhibition of gas appliances, notwithstanding the fact that the Association then was but 1 year old. We stayed in the East for our meeting in January last, under the advice of some of our good friends, who said, "While the baby is young, don't put him in an open bed where by chance he can roll out; but keep him in the cradle where there are sides up, and he cannot do himself any harm." Another illustration that was used by another friend was that when an eagle is exceedingly young, and his pinions have not developed, it is unwise for that bird to undertake to fly to a distance: but when the pinions have developed, when it has the flying power, then is the time to consider whether that eagle shall always make its nest here, or whether it shall make its nest somewhere else, some years changing about from year to year, here and there; so it was thought best to hold the first meetings in New York and perhaps go elsewhere later. The next meeting of the Association will probably be—I cannot say officially—the first week in December of this year. That date is talked of because it is the early part of the month, not that part when your "peak" is on; December, we understand to be the "peak" month with the gas men, but this is the first week in December. By that time the appliance manufacturers can be ready with their new appliances for the coming year, yet earlier than that they cannot be ready. With our annual exhibition of gas appliances, the first week in December, coincident with our convention, we can make our Association meeting a very attractive matter in dual form; as a meeting with good papers, and good discussions along strictly commercial lines, as an exhibition for the purppse of showing new goods to the older men in the industry, and showing the standard goods and the new goods to the younger men in the industry. These younger men are important factors, since the man who to-day is a solicitor may be a new business manager to-morrow. Before we have our next exhibition and our next meeting, there will no doubt be new business managers who were not in the field last year. They must be educated, and ours is an educational proposition. It is not alone for the new business manager of to-day. This is for the solicitor of to-day, the business manager of to-day, the superintendent of to-day, the general manager of to-day, with a view to developing each for his work of to-morrow, and the next day, and days to come. Now, if that Association should come west this next December, as has been talked of to some extent, there is a geographical point that perhaps would be the choice point for the Association: Namely, Chicago. As I say, it has not been decided, but it has been talked of, so it is possible that that might be brought about, and I believe it would be a most desirable thing. This great city surrounded by hundreds of gas companies, companies that could well send men who, while here would inspect the many devices on the floor of the exhibition hall, and at the same time, gain a lot of commercial information at the meeting during the session. A suggestion was made, and I have heard it repeated since I have been here, that another exhibition would be hardly possible for the National Commercial Gas Association, because of the fact that the American Gas Institute, at its meeting in Washington last October, voted to hold an exhibition in connection with its meeting, and some have said, if that were done, the National Commercial Gas Association, which is not as large an organization as the Institute, could not possibly hold a successful exhibition. I want to say that the Directors of the American Gas Institute met a few days ago in New York city, and I have a letter from the President, Doctor Humphreys, in which he says that the exhibition, by vote of the Directors of the Institute, has been called off for the meeting in October of the Institute, and furthermore that the suggestion made by the Commercial Gas Association to the Institute had been adopted, in that the Institute would appoint three men from among its members to act upon a committee with four from the Commercial Association, making a committee of seven, which would be the exhibition committee for our next exhibition in connection with our next annual meeting. That makes the Institute and makes the Commercial Association both patrons of the National Commercial Gas Association exhibition, and it will be a big exhibition, whether it is held east or west. I don't believe the Colisseum or an armory here would be any too large. I don't think the Madison Square Garden in New York would be any too large. If we were to come into Chicago and have an exhibition of that kind I believe it would prove exceedingly interesting to you gentlemen, and to others that are not here to-day. We should want you to come and to urge others to be present during the sessions of the Association Convention, and to see that exhibition of appliances. I want to extend to this, your Association—of which I am not yet a member, though my application is in, and my dues are paid—from the National Commercial Gas Association, the right hand of fellowship. There is every desire on the part of that Association to co-operate with every Association. I do not mean to suggest "affiliation" with this Association, because this Association rightfully affiliates with the Institute. We stand for the Institute, we stand for the Commercial Association, we stand for everything or anything that is legitimate for the growth and development of our fields. Our right hand of fellowship does not mean the lifted elbow and just the touching of the three fingers. We do not extend that sort of a hand to you. We don't want that sort of a hand from the west, but we want an honest grip of the western fashion, and we will return it. [Applause.]

Mr. Goodnow—Mr. President, I would like to offer this resolution, perhaps not to be put in the words I will say, but properly made up by the Secretary, that, on behalf of this Association, we want to express the hope that the next meeting of the National Commercial Association be held in Chicago. We do not need to say that this is the second city in the country, and as it is much nearer the center of population than any other city in the country, we think it would be the proper place for the next meeting of the National Commercial Gas Association. [The motion was duly seconded and carried.]

Response of Mr. Bigelow.

Mr. Bigelow—Mr. President, allow me the privilege of extending the sincere thanks of the National Commercial Gas Association to the Gas Association of Illinois. I shall take exceeding pleasure in going back to New York with this news, for I know it will have very careful consideration, and I believe that that added weight in the balance will bring the National Commercial Gas Association to Chicago, the first week in December, 1908. [Applause.]

The President then introduced Mr. H. Seidenglanz, of Rockford, Ills., who read a paper on the subject of

NEW BUSINESS METHODS.

It has been truly said "This is an era of specialization," and well can this be applied to gas companies. The prosperity of any company depends largely upon the proper selling of its product.

We all know that the "fixed charges" of a gas company remain about the same, even with a large increase in the gas sold, but the distribution cost per 1,000 is very materially reduced by a large increase in sales.

The gas man's old axiom that "The money is made or lost in the

retort house" is true to-day, but it must also be said that the sale of gas per meter in use, and per mile of main, has a great deal to do with the net income of a gas company. In all but the small companies there should be a commercial department, in charge of a specialized superintendent, whose executive ability should compare favorably with the heads of other departments.

You will find in all other manufacturing industries which are successfully managed, that the selling department is a very large and important factor of the organization. So I contend that the selling department of a gas company should be as well organized as the other departments of the business.

The man in charge should be familiar with the various appliances for the use of gas in any form, and should devote his entire time to this matter, keeping in such close touch with the business and peculiarities of his work, as to be able continually to find new uses for the product.

He must be alert to the possibilities of every meritorious gas burning appliance, should exert every effort to acquaint the consumer with its advantages, and be able to point out the defects of inferior appliances in use or proposed for use.

Right here we encounter the question as to "What is the best method of advertising?" Nearly all advertising plans have their value, but I believe keeping continually in the mind of the public through the medium of the daily papers, with a daily change of well worded display "ads." is the very best means of advertising; but good solicitors and good service to the consumer enter into and are large parts of the problem "how best to advertise."

The first consideration in selling any commodity is that it shall give entire satisfaction. The consumers of a company that sells good gas and gives good service with complaints well taken care of, are getting better results than are those of a company which sells gas at a lower price but does not pay attention to service rendered or complaints made. It therefore becomes necessary that all departments shall work in harmony with the commercial department (and for that matter with each other) giving to the superintendent of the commercial department any information that will enable him to save a consumer or gain a new one.

It is especially necessary that a good "Trouble Man" be employed, one who has a thorough knowledge of gas appliances in general, and can readily adjust any defect in their operation. A demonstrator is indispensable; for many times inability to bake properly is due to lack of knowledge on the part of the consumer, and unless properly taken care of it results in the oven being used as a store room for pots and pans.

A good solicitor will find innumerable cases that require the services of a demonstrator, and when properly followed it will result in increased consumption, either through present installation or by the sale of additional appliances. Moreover, it tends to promote a friendly feeling between the company and the consumer.

The old slogan "Cook with Gas" cannot be too generally used, but it would seem that during the past years our attention has been directed to selling ranges, with the result that the industrial and lighting ends of the business have been seriously neglected.

It requires someone better than the average solicitor to secure this class of business, and the question "How to secure and retain good solicitors" is an important one. Any man with a little energy can go out and sell ranges, but I hope the time is passed when a company will hire men for the range season, and release them at the first sign of cold weather. I do not want you to infer that I particularly urge the pushing of range sales from 1 year's end to the other only, but I do consider it policy to confine our efforts to the line that will bring the best results regardless of season. Just as an example, 15 industrial consumers (including 3 gas engines), for the month of February show a consumption of 690,000 cubic feet, or for 12 months, 8,280,000 cubic feet, equal to 552,000 cubic feet per meter. The domestic fuel consumption in Rockford will average 20,000 cubic feet per year. You can readily appreciate what benefit is to be derived from a vigorous prosecution of this class of business, over the installation of domestic ranges. Do not think for a moment that I advocate the lessening of effort to get domestic fuel consumers, but I do especially wish to impress upon you the importance of the industrial end of the work from the standpoint of its absolute money value to the gas company. From the above it is apparent that not the solicitor who sells the greatest number of ranges, but the one who sells the most gas, is of the most value to the company, and, therefore, I am firmly convinced that the best method of paying solicitors is on the estimated increase of gas sales.

In order to arrive at a working basis we must place a certain value on each man (not individually but collectively) and guarantee him a monthly salary sufficient to provide the necessities of life while he is getting a start, and thus also assure him of some compensation at all times (as the best solicitors have been known to fall down at some time or other). This amount will naturally vary with the location. In Rockford we guarantee $50 per month and place a bonus of $25 per man in a pool, which is divided each month according to the number of points secured (the revenue being based on the first month's consumption following the installation of appliances), each class of business having a certain value in points per dollar yearly revenue. This value would also vary somewhat with the locality, depending upon the class of business that is most desired.

In Rockford the value of different classes of business and the number of points allowed for each class, together with their classification, is as follows:

A. Service application (accompanied by order for range or other equipment) 5 points per dollar yearly revenue.

B. Dead service (in case of succession service is not considered dead) 15 points per dollar yearly revenue.

C. Industrial business, 10 points per dollar yearly revenue.

D. Additional business (no meter required) 10 points per dollar yearly revenue.

E. New business (meter required) 7 points per dollar yearly revenue.

F. Succession; no points allowed unless new equipment is supplied.

G. Betterment of equipment; 4 points per dollar yearly revenue.

H. 25 points additional is allowed for the sale of 18-inch double oven or elevated oven ranges.

J. 50 points additional is allowed for the sale of cabinet ranges.

K. Arcs on rental; 5 points per dollar yearly revenue.

L. Arcs sold; 10 points per dollar yearly revenue.

The city is divided into territories, and each solicitor is required to devote his entire time to his territory, making a systematic house-to-house canvass. Cards are made out by solicitors showing each call made and the result of such call, and where a prospect for a future is filed geographically in a cabinet provided for the purpose and used as house information cards. Business secured by the company within 30 days after such call has been made is allowed, and full credit passed to the solicitor, only when report is clear.

All solicitors are obliged to report at the office each morning at 8 o'clock, showing result of previous day's work, when matters of interest are discussed and the day's work outlined. Every 2 weeks we hold an evening meeting, when some gas appliance is dissected or the comparative cost of the various agents used to produce light, heat and power are discussed. In fact, everything possible is done to broaden the solicitor's knowledge and better equip him for his work. The principal feature of these evening meetings is that they tend to inspire the boys with enthusiasm in their work, which is one of the greatest factors in the success of any undertaking, for when impelled by enthusiasm men carry their work to the highest point of material success.

Enthusiasm has been defined as "The inspiration of all that is great," and as a Western editor once remarked to a man sneering at enthusiasm, "There is only one thing that can be done in this world without enthusiasm, and that is to rot."

I find that the bonus acts as an excellent incentive, creating a friendly rivalry among the solicitors, as each one endeavors to get ahead of the other, and it has resulted in a very substantial increase in our industrial and arc lighting business. Relative to the latter, I might state that we have been renting arcs for some years, with the disagreeable feature of having a large number returned with the approach of spring, because of longer days and warm weather. To overcome this, you will note we have placed a value of only 5 points per dollar for arcs on rental and 10 points for arcs sold, with the result that out of 495 installed during the past season only 75 were on rental, although when the proposition was first put to the solicitors on a basis of 10 points "sale or rental," they said it would be impossible to sell arcs with our competition. Hence the change to 5 points for rental and 10 for sale, with the above result.

One of the things we all have to contend with is dead services. An excellent way to get them into use is by placing a large bonus on this class of business.

I hope the discussion to follow will bring out some points of interest and benefit to us all, and in conclusion I wish to state that, in my opinion, the three most essential features of a successful commercial department are, advertising, soliciting and demonstrating.

Discussion.

The President—Gentlemen, we have listened to a very interesting paper. I hope it will bring out a full discussion.

Mr. Bigelow—A plan was adopted a year ago by the Suburban Gas Company, of Chester, Pa., in this matter of prizes. They came to the conclusion that, instead of offering money prizes, the good of which when won was of short duration, the money being spent, and with it the man's enthusiasm having disappeared, they would offer a membership in the—I am not going to use the National Commercial Gas Association as an illustration only, in place of that suppose we consider a membership in your Association—to the man in the Company who achieved the cleverest results, with the privilege of that year attending the convention, all his expenses and membership paid by the Company. That man goes to the Association meeting and absorbs a lot of good and valuable information. He feels the responsibility. When he comes to our meeting we provide him with a badge, engraved with the words, "Prize representative from Chester, Pa.," or "Prize representative from wherever he may come from." He wears that badge, which is a very neat affair, with a good deal of pride. In the meeting we point to him as having achieved exceptional results for his Company. He goes home and develops the ideas that he has absorbed. His associates gain from him a lot of this same information. It makes them better salesmen. The results are lasting. The results are good for the man and for the Company, and I suggest that you can increase your membership and increase the ability of these men to sell your gas by that method. We make this rule, that the Company may transfer that membership to another of its solicitors, if the next year that solicitor does not happen to "win-out," who was the member the year before. The employee-membership which is bought by the Company, is transferrable to its prize man each year. Of course, the man who gets it this year and has all his expenses paid is mighty glad to go back next year, and his associates are very thoroughly determined that he shall not. I believe you will add to your membership and to the efficiency of your men by adopting that plan.

Mr. Strohn—I would like to ask Mr. Seidenglanz a question or two about what I call the point system. I understand it has been worked successfully by many gas companies. Now, if a man brings in an order, of course, there is no certainty that the order is going to be filled. The credit department has to look it over. Sometimes it takes a week, sometimes 30 days to decide whether or not that order shall go through, and I am wondering whether or not there is some feeling of dissatisfaction on the part of the solicitor in his own mind who thinks an order ought to go through but finds it has been turned down. That is simply a question which I wanted to raise. I would also like to emphasize the point Mr. Seidenglanz brought up, that there should be harmony between the office force, the shop and the heads of the different departments; in fact, I think the solicitors should have the first call. The members of the office force have their rules which are easy to follow. All the members of the shop force have to do is to fill the orders as they come. The solicitor has no set rules. He handles no two prospects in the same way. He must adopt different methods with different men. He has to promise to do a piece of work on a certain date, and sometimes the members of the office force are provoked to think that a solicitor wants a job rushed; but he does not realize the trouble he has in gaining this man's consent, and I think he should be given first place. If a solicitor, or the manager of the new business department, wants special concessions, some special information as to prices, or anything of that sort, looked up, he should be given attention at once, because if the three departments are not pulling together you will not get the best results.

Mr. Vincent—I listened with a great deal of interest to this paper, and I think its two best points are: First, the sale of gas appliances; second, enthusiasm. If you can get solicitors to start from your office, filled with enthusiasm, they will bring in business; it doesn't matter how or where they are sent. If you inculcate in these men the idea that they are selling gas—not selling stoves or arc lights, but are selling those things to be put in a place where they will bring in revenue for gas—you are doing the best work. As to the point system, I think it has many valuable features, but I have pretty nearly made up my mind it is applicable to only very few instances. To begin with, it requires a great deal of familiarity. The average force of solicitors that you are obliged to employ in these times of more or less scarcity of labor requires a good while to get them on to the working of the system, and very often by the time they become thoroughly familiar with it they give you notice of leaving. Very likely in starting a new soliciting department the point system, or some variation of it, will be very valuable for the training of the men; but I think in an old soliciting force, where your men are thoroughly familiar with the territory and are enthusiastic, that it is of very doubtful utility. I think a straight salary system will bring you in better results. Another point in new business is the trained solicitor who is thoroughly familiar with the art of illumination. We have come to a point in the gas business where people do not care to a certain extent how much they are paying for their gas or how much they are paying for their light, as long as they have the light where and when they want it. The shopkeepers in many large cities are running the flaming arc at an outrageous price. Now, if the gas company could put on a large unit in competition with that flaming arc that will not use an excessive amount of gas, there would be no trouble in placing them at all, because the people want light and they want it where they want it, and they don't care how much they pay for it.

Mr. McKee—There are only one or two points that I want to bring out, the first of which is the combination method that we are beginning to use, whether we will follow it or not, and the question of keeping track of our men with a combination of the point system and the salary system. A monthly ticket is kept for each man, on which are the number of sales the man makes, the cost price of the appliances, the selling price and the profit on the appliances, another column showing the number of feet of gas that the appliance sells. That column cannot be filled in until 2 months afterwards on estimates taken from actual meter readings. Assuming that it is worth $2 to sell 1,000 feet of gas—that is, assuming we get what it is worth, some arbitrary figure, according to the number of thousands of feet increase in revenue—that represents the cost of keeping that man out for a month, and when that becomes a negative quantity it does not pay to keep that man, or else the arbitrary charge for the value of the gas sold is not right. It simply reduces the thing to a question of mathematics. A man may be working hard, with every reason to believe he is working effectively, but it is not showing on that sheet; but that can be used without making any odious comparison between the men at the end of the month. A man may feel if he is paid on a straight salary system, I am getting $100 a month and here is another fellow getting almost as much as I am, and I turn in twice as much business as he does, so I will lay down on the job for a while. I know it works that way. A fellow will save up his calls for 3 or 4 days and go to the ball game; in fact, I have known a good solicitor to be at the ball ground 3 days in a row, and yet have enough orders to turn in for the whole 3 days. And the solicitor who can do that is just the man that you want at work the whole 4 days. Another thing is the magnitude of the industrial business. I don't think it is quite understood just how great the possibilities of industrial business are. One of our men went into a place the other day where the man claimed to be burning $27,000 worth of coke a year, and he said, "We will give you that business if you can deliver the goods." I believe we can deliver the goods. In one section of the city of Chicago less than 1½ miles square the industrial business amounts or should amount to something like 100 million feet a year. I have in mind a place in Detroit, where the Detroit City Gas Company for the past 4 years has derived a revenue of $15,000 from one style of furnace alone—an aluminum melting furnace, of which they have some 35 in use, which are being operated with perfect satisfaction to the consumer, and I think they are burning about 29 million cubic feet of industrial gas per month at the present time. Of course, that has been a steady growth; it has been 3 or 4 years accumulating. The bake oven business alone in Chicago would probably increase the amount of gas used by 3½ per cent., there being 500 bake ovens which take about 3,000 feet of gas per day. Such an insignificant matter as china kilns. Of these regulation china kiln we sell 400 in town, which cost about 25 cents apiece to fire, each firing. Some of these are fired every day in the week. That is only a few of the great number of uses of gas for industrial purposes. We have on the floor of the Peoples Gas Light and Coke Company here in the city no less than 10 or 12 kinds of furnaces, and hope to increase that to some 40 or 50 kinds. Each one of those furnaces has up to 1,000 applications here in town, and that would apply in the same way to other towns.

Mr. Quackenbush—I would like to know from Mr. Seidenglanz what objection he would have to penalizing solictors for lost business. Mr. Seidenglanz makes the statement that he estimates his consumption on the first month's use of gas. A great many times an appliance that is sold is returned to the company at the end of two or three months. If the solicitor was penalized for the loss of that appliance, wouldn't it tend to not only make him anxious to secure new business, but to hold what has already been secured? A point in

favor of what is called the point system, I believe, is that the average solicitor is afraid of handling a big prospect. He does not seem to realize sometimes that from the economical standpoint he has in his hands a mighty good weapon to secure business. He will naturally take the small jobs in preference to the big ones when selling appliances instead of gas. Some solicitors would rather go after the big ones and forget the little ones, but the average solicitor wants to take the little ones. With the point system I think you have an inducement there right along to argue for your solicitor that it is the big ones, the paying ones, that you want him to go after. We are just about to start in to use the point system in East St. Louis. I know it is going to take a little more bookkeeping, but I believe I see that the increase we are going to get in good business will more than pay the little extra bookkeeping cost, I think it is going to serve to make the solicitors a great deal more successful as such. I would like to know from Mr. Seidenglanz what would be his objection to penalizing on lost business.

Mr. Whipple—In confirmation of the remarks of Mr. Quackenbush we had a solicitor that one time brought in more orders for ranges than any other man, and got quite a commission—we used to give at that time a commission on ranges sold. After we put in the point system this man found he was outstripped by another man who got $35 or $40 commission because he was selling gas and the other man was selling ranges. When that happened he dropped down from perhaps $70 or $75 a month, down to $40. Then he said, "I will try to do that myself," and to-day there isn't any sort of a proposition that he would not tackle.

Mr. Vincent—Mr. Quackenbush's argument against the salary system for bringing in industrial business is a good one, with this exception. I think it is almost impossible to expect in a corps of solicitors that every one of a set of men will be able to handle an industrial proposition, and if your men are on a salary basis and they get a good prospect of an industrial proposition, they turn it over to the men who can develop it. Every large gas company can well afford to employ an expert industrial man to work up that proposition who can work on it much better than the average solicitor can.

Mr. Quackenbush—I did not exactly mean industrial business alone. I meant big business. East St. Louis, for instance, has a great number of freight houses, where they require a great volume of light. The solicitors had the feeling that they could not interest those people at all. Finally, on going after them we found we happened to hit them just at the right time—I guess you know the reason, because they are cutting expenses wherever they can. They are very willing to talk over the question and some of this business is coming our way. Next we took up the factories and figured on the proposition with them, and have achieved very good results.

Mr. Parker—As you all know, there are solicitors and solicitors. Until recently we have principally employed solicitors to sell gas stoves and kindred appliances, and they were not expected to sell gas. Of course, we want to sell gas. The gentleman from Rockford evidently has given a good deal of attention to the question that is now being discussed, but I do take exception to his statement that he believes, in securing new business, first comes advertising, then solicitors, then domonstrating, in the order of one, two, three. My experience has been, and I believe it is borne out by a majority of you, that first-class solicitors will bring in very much more business in proportion to the amount of money expended, than the best newspaper advertising that we can get, although we all have our reasons for advertising in the newspapers. The place where I was last, as an illustration in point, had a section of the city very largely populated by Germans. Of course, the Germans as a rule are conservative, but we looked the field over and thought that possibly there might be a little business down there, and we started in to advertise in the newspapers and published columns and we published half pages, and occasionally we would get reckless and publish a page, and at the end of the year or 18 months, I think perhaps south of State street, which was the dividing line between the south and the north, I had perhaps 8 or 10 gas ranges in use. Well, something had to be done; so we hustled around and got a couple of solicitors who could speak German. We put them in the field, but unfortunately we started rather late, perhaps in August, but we went after them. Next season we started bright and early, and that year in that south town district we sold 100 stoves. That looked brighter. We went at that same territory over and over again that summer and fall and now, I believe, while I am not in that city at the preseut time, that it is one of the best locations they have, and is a tribute to the efficiency and persistency of first-class solicitors. While on the floor, let me say, I believe we are paying at the present time a little bit too much attention to getting new business, and not enough attention to holding and satisfying the business which we now have. I believe the goodwill of our consumers is a most valuable asset.

The President - I will ask Mr. Seidenglanz to close the discussion.

Mr. Seidenglanz - To begin with, I believe Mr. Bigelow misunderstood me. I want to correct the impression he seems to have, that the bonus is offered as a prize. It is really a part of the man's salary, which depends upon the amount of business he gets; but I also believe, however, that offering an annual prize would be an additional incentive. In answer to Mr. Strohn, relative to solicitors securing orders and getting their bonus on what might turn out to be phony ones, I want to say that each solicitor is obliged to fill out an estimate card, giving the name, address, appliance sold, and the estimated revenue, together with the estimated investment covering the installation of that appliance. That estimate card is attached to the order, and is held until the appliance is installed, when it is detached and given to me, and I hold it for 30 days. Then we compare the estimated consumption as made out by the solicitor with the actual consumption according to the meter, and he is paid accordingly. Relative to creating harmony among the various departments, we have just recently adopted a plan which was instituted at East St. Louis. It is a system of "Information Cards" made on ordinary bond paper, 3 by 5 size. They simply contain the words "Information Card" at the top, the balance of the card being blank with the exception that at the bottom it states that "The card is to be used to supply any information that may be of interest to the Company." Every man in our employ is supplied with a pack of these cards, and if he runs across anything he considers a prospect for new business, he turns in a card which comes to the commercial department, so that everybody is boosting all the time. Mr. Vincent spoke of the point system causing considerable bookkeeping. We have had this system in use since the first of May, 1907, and up to now I have personally taken care of all the work in connection with it. It takes me about an hour a day for 3 days at the end of the month to figure out and distribute the bonus. It would, however, entail considerable more bookkeeping if the bonus were computed on the basis of a per cent. of the actual increased gas sold over the amount for the same month of a year previous. I know of two companies that adopted systems of this kind and have abandoned them. As to teaching solicitors the value of this point system and the way to fill out these cards, we have had no trouble whatever. We simply supply each solicitor with a sheet similar to that I have shown you this afternoon, and he begins, with his first sale, to fill out his blank. Of course, there may be a few things that they do not understand at once, but after the first week or two we have had no trouble whatever. The objection I always found to paying solicitors a straight salary is, as Mr. McKee brought out, that one solicitor will get a great deal more business than the other, and, being paid the same amount of money, he naturally lays down on the job and takes a vacation occasionally in order not to get too much business. In other words, he establishes an "amount of business secured" basis, and is satisfied if he reaches that point; but the minute he realizes that the more business he gets the larger will be his bonus, he will never be satisfied until he gets the most money, and that, of course, he can only do by selling the most gas. In relation of the art of illumination. As I stated in my paper, we hold meetings for the purpose of educating our solicitors along this line and have given them some practical demonstrations showing the relative value of various lighting appliances, both gas and electric - fortunately we have current in our office to operate electric fans - and when a solicitor finds what he considers a prospect, whether using electricity or some other form of illumination, a new man will at times be at a loss as to what he should recommend. In that case it devolves upon the superintendent of the commercial department to figure out a plan of illumination best suited to the particular case. I find that the gas arc has been, and is, the best means of illumination for stores and factories. Some nooks and corners require smaller lights, where the gas arc would be too expensive to operate, and in those cases we endeavor to supply what we consider the best Welsbach light obtainable for that purpose, probably a No. 60 with a green shade over a desk, and more recently a Reflex lamp with a green shade. I have one case in mind where, in a factory which we light with about 20 arcs, there is one machine which is removed from all the others. In order to light it, we simply dropped a straight piece of pipe with a Reflex light at the end of it, equipped with metal shade. I would like to ask Mr. Vincent whether the flaming arc he speaks of is used inside of these stores.

Mr. Vincent—My understanding is it is used outside for advertising in front of shops.

Mr. Seidenglanz—I have not seen them in use inside, with one exception, which was in a showroom called the "Penny Arcade." I also believe the fumes created by those arcs are injurious to health and that they should not be used inside. As far as the lighting of stores or windows is concerned, it is not the proper light. It does serve to attract attention, however, and is being used for that purpose. We are about to put up a blackboard showing the standing of the solicitors each day, according to points, which I believe will be a good feature, as each man will know every day just where he stands. That system is used in Milwaukee with very good success. Relative to penalizing solicitors on business that is lost in their territory, I doubt whether that would be practical. Of course, where a solicitor brings in an order for an appliance and it is not in use after 30 days, he naturally does not get any credit for that sale, because he does not get his bonus on that appliance until it has been in operation for 30 days. Usually when it is in operation longer than that it is considered a permanent installation; at least it has been so with us. I think what Mr. Quackenbush had in mind was they have a very large floating population; that is, many people move in and out over night. We don't have very much of that sort in our town. Of course, in such a place there would necessarily have to be some modification to the point system. Our system is somewhat different from that used at Milwaukee, from which it was originally copied. I also found, as Mr. Quackenbush said, that solicitors are inclined to be timid in approaching the big prospects, and unless you keep very close tab on your solicitors, and familiarize yourself with their territory, you are liable to do without considerable business that you really ought to and could have. I have in mind one case where I was convinced, from the information contained on the cards turned in by a solicitor, and subsequent conversations I had with him, that he had repeatedly passed up two large factories in his territory, probably due to the fact that they are known to be difficult places of access. I accordingly called on them myself and immediately secured an order for 4 arcs in one place and they have since added 6 more. The solicitor received no credit for this, but within a week he discovered these arcs working, and it evidently braced him up, for he has since succeeded in placing arcs in the other factory and opened up a channel for some nice business later on. A solicitor frequently asks me to accompany him to some place where he thinks he has a prospect for business. I always refuse to go until he can show me he has called there himself and knows that there is business to be had. I do not like to take business away from a solicitor, but I rather encourage him to make these calls, and, even if he cannot get the business himself, give him a chance to increase his knowledge along these lines by getting into factories and stores and figuring out for himself whether or not there is a prospect for gas appliances, after he has made a call. In the end I gladly accompany him, and we endeavor to place such appliances as we think the consumer should have. Mr. Parker seems to take exception to the placing of what I term the three essential features of a successful commercial department, viz.: Advertising, soliciting and demonstrating in the particular order in which I named them. I believe that each and every one of them is simply a part of the great advertising scheme. They all come under the head of "general advertising," and I am a great believer in any form of advertising which is good; I do not believe in billboard advertising or hand bills. Neither do I believe in spasmodic advertising in newspapers; that is, advertising once a week or so with a large display, but rather in a daily change of well worded display ads., as stated in my paper. Mr. Parker gave his experience with the German population as an illustration. In our case the situation has been just the reverse. We have a very large Swedish population in Rockford and have endeavored to secure the business by placing Swedish solicitors in that territory. We found, however, that the Swedes prefer to deal with one of another nationality, and have been very successful in placing ranges among them. We also advertise regularly in the Swedish weekly paper, and I cannot but feel that the advertising, mentioned by Mr. Parker preceding his solicitations, must have been of some benefit to his solicitors. Relative to paying attention to old consumers and giving them good service, our point system takes care of that very nicely, as we pay a solicitor nearly as much for selling a new range to an old consumer as we do for selling a new range to a new consumer. We pay 5 points per $1 on the latter and 4 points on the former, which we call "betterment of equipment." I thank you.

Mr. J. B. Howard—Solicitors have been mentioned so often by the different members, that it occurred to me to give a little reminiscence of the original and first solicitor in this country for gas stoves. The happening was in Brooklyn, N. Y., in 1849. In the service was an Englishman named John Powers, who came from Birmingham. The "Plumbers and Gas Fitters" of Brooklyn determined to have a supper. Powers said: "I will get up a gas stove and we will have all our cooking by gas if you want to." This was readily assented to and Powers built the stove. One of the boys had a cousin employed on one of the ocean steamships. As the ship happened to be in for a couple of days he went over to see his cousin and brought back with him an English rabbit in time for the supper. If I remember rightly that was cooked by this stove. All the cooking was done, the rabbit, the fish, the roast, the potatoes and all of that; and I believe that was the first or original solicitor in this country for cooking by gas. [Applause.]

The President—Gentlemen, we are very glad this afternoon to have with us Mrs. Helen Armstrong, who has taken a very active part in the development of the gas industry. I will be glad to have her say a few words if she will.

Mrs. Armstrong—Mr. President, it is always a woman's privilege to change her mind. When I was asked earlier this afternoon to speak, I declined; but some points were brought up this afternoon in the discussion regarding gas ranges, which, of course, I am more interested in than any other line, that I feel I would like to emphasize. In dealing with women, the practical thing is what will appeal to them every time. There are four certain points which have always been emphasized rightfully enough in regard to the advertising of gas ranges: Those are economy, comfort, cleanliness and efficiency; but it seems to me, from what I have seen throughout the country in the last 11 years, there is not enough specific advertising showing the advantages of gas as a fuel over other fuels. We say it in a relative way, and it is good theoretically; but why isn't it better to state definitely just why a steak that is broiled under a gas flame is more healthful, has a finer flavor, and is far more appetizing than a steak that was broiled over coals. My work is strictly practical, but I think you will find these things appeal to women every time. Take the cuts in the papers showing a roast being cooked under a gas flame; it looks just like a block of wood. There is nothing interesting, nothing appealing, and so I will make this point. You all know as well as I do how many women there are who are using gas ranges and who never do any baking; how many more women there are who do no broiling. You have all seen the illustration in the paper showing the uses of the gas oven, and there is a roast, a loaf of bread, a loaf of cake and a pie. It looks very nice, but any woman who knows anything about cooking knows that you cannot cook those four articles at the same temperature. So I wanted to bring those things home to you, because I am talking from a woman's standpoint. I know it is late, and I don't want to take too much time, else you would think I was like the woman whose husband came home one night and while she was getting dinner she talked all the time, talked while they were eating, talked all evening, talked going to bed, and when he woke up in the night he found her talking, and he said, "My dear, are you talking again or yet.". [Laughter and applause.]

On motion of Mr. Runner a vote of thanks was tended for the valuable paper submitted by Mr. Seidenglanz.

The meeting adjourned to reconvene Thursday, at 10 o'clock A.M.

(To be Continued.)

Some Aspects of the Interdependence of Industrial Progress and Higher Education.

[Address at the Banquet of the Illinois Gas Association, by DR. W. A. COLLEDGE, Armour Institute, Chicago.]

Mr. Toastmaster and gentlemen: I feel no small measure of diffidence in rising to speak this evening; first, because the topic of my address savors somewhat of an opiate; second, because I am an Americanized Scotchman, and lack entirely that easy grace of expression which seems the natural heritage of the native born American.

To give you a slight idea of some of the difficulties of speech which I have to overcome. In the little highland village where I was raised we have a habit of introducing the pronoun "he" into many of our sentences, and these sentences, when heard by a foreign ear, sound simply ridiculous. I remember one morning of our parish minister entering the pulpit and announcing for his text: "The devil as a roaring lion goeth about seeking whom he may devour;" and he began his sermon in these words: "Brethren with your permission I

will divide the sermon into four heads. First, I will endeavor to inquire who the devil he was; second, where the devil he was going; third, we will ask ourselves the question who the devil he was seeking; and, fourth, and lastly, we will endeaver to solve the problem that has never been solved before, viz., "What the devil he was roaring at." [Laughter.] And so, gentlemen, if I happen to lapse into one of the idioms of the far north I pray you will overlook it.

I suppose it is almost commonplace to speak of our age as a marvel of advancement; yet I am afraid that we allow such words to pass our lips without a clear appreciation of their meaning. For example, how many of us remember that 2,000 years ago a man could make a journey, from Rome in Italy to Paris in France, as quickly as he could make that same journey in the opening years of the 19th century. That when the Apostle Paul preached his sermon on Mars Hill the houses in Athens were as brilliantly lighted as the houses in New York or London or Paris in the opening years of the 19th century.

I have an old friend who is about 95, perhaps 97, years of age, and that man has lived through the most wonderful period of the world's development. When he was a child in his mother's arms Fulton was experimenting with the first steamship on the Hudson river. When he was a little older he could have taken a ride in the first railroad train; when he was a little older he could have sent the first telegram, a little later and he could have bought the first sewing machine; and so on during his lifetime have come those marvelous developments which the rhetorician delights in speaking of as the marvels of the modern world.

When you dip into history you find that modern philosophy has its roots away back in the days of Lord Bacon, and that modern astronomy goes back to the years of Galileo, but the romance of the manufacturer of power is a thing of our own age. It is the engineer of to-day who is writing that great chapter in the world's experience.

Sir George Ponsonby was Secretary to the Prince of Wales; that is the then Prince of Wales is now King Edward of England. At that time the Prince determined to visit India that he might become familiar with his future subjects, and Sir George accompanied him. On their return a gentleman entertained Sir George at a dinner. After the dinner, while seated over the walnuts and wine, the host turned to Sir George and said: "Sir George, tell us one of your hunting experiences." And Sir George said: "When I was in India we were in the country of the Rajah of Cawnpore, and he gave a great tiger hunt. Each of the prince's followers was provided with an elephant, and we started for the jungle. On the third day I saw, a short distance from my elephant, a splendid tiger. I took careful aim, fired and killed him. When we measured him he measured 18 feet from the tip of the nose to the point of the tail." "Excellent; magnificent shot," a number of the gentlemen said.

Now there was an old Scotchman at the dinner who had listened to the story, while he sipped his whiskey and water, but when they had all finished, he said: "Well, Sir George, I am not much of a shot, but I am a great hand to fish. We have a fish in Scotland called the scat, and last year when I was up north I went out fishing, had a bite and I pulled it in, and it was a scat, and it covered 4 acres." [Laughter.]

Well, there was a dead silence. One after another of the guests arose from the table and left, then the host came to the old Scotchman and said: "Now, look here; you must apologize. Sir George feels insulted; you must apologize." "Weel," said the Scotchman, "I canna apologize, but I weel tell you what I weel do. If Sir George will take 8 feet off that tiger I will see what I can do with the fish." [Renewed laughter.]

Now the trouble with Sir George was exaggeration, and to the uninformed ear to-day many of the marvels of engineering can only be explained from the viewpoint of miracles. Naturally the early advance of engineering demanded a new form of education, and the rise of the schools of applied science brought about as great a revolution in the existing ideas of education as many of the inventions, which have transformed the industries of the modern world.

It is hardly necessary for me to say anything about the work of the technical school, but one feature worthy of your attention that is becoming more and more emphasized, is the attempt to give the technical student a larger measure of cultural training, so that when he leaves college he will be familiar with the great culture of the modern world.

The fact that many of the ablest engineers of the past had barely a common-school education has been used by many as an argument against technical education; but we must remember that the engineers of the past were pioneers, and the work of a pioneer is very different from the work of the men that come after him. I know a farmer in Southern Illinois who came West in an early day, settled on 150 acres of land, and started in a small way to raise fruit. He made a reasonable income. When his boy grew up he desired to go to an agricultural school, and his father reluctantly permitted him to go. After 3 years' training the boy returned to work with his father, and at once wanted to apply certain new ideas to the farm; but the father said: "No, there are two fields of 20 acres each. Take them and go and farm all you like and I will take care of the rest of the land."

In less than 3 years, however, that farmer had turned over most of the management of the farm to his son. The son had taken a course in the chemistry of soils. He knew a good deal about stock raising; had taken a thorough training in horticulture. In time he changed over the farm from corn and wheat and oats to fruit, and to-day father and son are raising all kinds of fruits and live in luxury, largely through the result of the technical education of the boy.

Now, men of the pioneer generation came into contact or competition with men of the same limited education, but the men of the next generation come into competition with educated men. To-day it is just the old story of the blunt axe and the sharp axe; if you try to cut wood with a blunt axe, then lay it down and take up a sharp one, you will immediately discover the fact that you save time by stopping to sharpen your axe. It is true that the young graduate leaving the technical school is a little heady, a little egotistical, has what we sometimes speak of as the big head; but while a big head can be whittled down, there is absolutely no hope for a little head. [Applause.]

Another thing, the big head is curable and every one of his friends will help him to get over the disease. [Laughter.]

A very good illustration of egotism is told in a history of Scotland. During the Crimean War, a few minutes before the Highland brigade was engaged with the Russian cavalry, a Scottish soldier prayed in these words: "Oh Lord dinna be on our side and dinna be on the other side, but just stand a wee bit away from us both and you will see the toughest fight that was ever fought." [Renewed laughter.]

All institutions created by man make mistakes. The only people who never blunder are dead people. Talking about blunders, there are blunders in language. Down on the South Side at a colored church the old colored minister, or one of the deacons, prayed in these words: "Oh may the earth be covered with Thy glory; may the inadequate become adequate; the intemperate, temperate; and the industrious dustrious." [Renewed laughter.]

And again, an Irish friend of mine who was writing to a neighbor with whom he was very angry, began his letter in these words: "Dear Sir—I am writing this letter with a sword in one hand and a revolver in the other." [Renewed laughter.] So, you see, mistakes are common to all men and all institutions. If there is one weak spot in technical education to-day it is that the schools give their graduates "too academic devotion to the ideal of technical perfection and an inadequate idea of the imperative character of commercial necessity;" and, as a result, the young graduate is apt to look to and strive for a technical perfection that the business is not capable of standing.

Now, in my opinion, the cure for this mistaken ideal is to keep the practical man's interest from drifting away from the technical school. If I were going to offer any remedy to keep the technical education right in line with the ideas of the men in practical work, it would be this: "That the general educational scheme of a technical school be brought nearer the plane of practical professional work, nearer the life the graduate is to live." That can only be accomplished by the technical school having the co-operation of the engineers who are solving the practical problems of the world of industry. For example, take a boy in his third year in a technical school. Suppose he could leave the school and spend the last half of the third year in practical work in a similar industry to that in which he was taking his course. He would return to college for his fourth year with a better practical knowledge of the problems and principles necessary to master than if he had remained with his instructors and been told by them at second-hand. [Applause.]

Again, if the engineer of to-day who is out in this great busy world of ours solving the practical problems of the trades would look over the courses of our technical schools and make suggestions in regard to changes, the courses could be kept right up with the development of the profession, and the training of the student would be greatly advanced. Again, if you gentlemen would visit the Armour Institute of Technology as opportunity offers, and make little informal talks to the young students in the line of your specialty, you have no idea

the uplift and inspiration it would be to instructors and students. Technical education has done much for the advancement of the industrial world, but if the schools of the future have the advice and hearty co-operation of the men in the field, there is absolutely no limit to their usefulness. And the message of the technical school and the instructors of technical schools to the gentlemen of the Illinois Gas Association is this: "Give us your help and have faith in our sincerity in striving to turn out well trained and thoroughly equipped men." [Applause.]

The Perils of a Lineman.

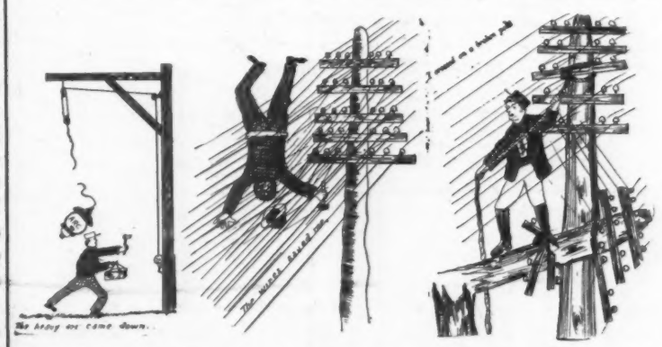
[Prepared for the JOURNAL, by "R."]

I am quite convinced that an electric light man can get into more trouble in his regular line of labor than any other workman. There is always something happening unexpectedly to jar him. It may be that a comrade on the cross-arms above drops a wrench upon your head, or that a careless driver of a grocery wagon runs his wheels against you and your equipment while you are trimming lamps in the middle of the street. Not long ago, as I was adjusting the carbons in a lamp which I had lowered from its height on a pole, a runaway came down the road. It was not possible to elevate the arm in time—it was one of the dropping-arm pattern of lights and there was quite a combination of wires, glass globes, lamps, carbons, etc., hanging midway in the street through which the runaway had to pass. The runaway did not stop for the mass of stuff, but simply went bang up against it. I leaped to the ditch in season to avoid getting myself damaged. The runaway bumped into the lamp, getting a severe jar, and down he went with a tangle of wires. It took an hour to get the horse and rig free. On another occasion, while I was quietly adjusting the lamp, cleaning the globe and getting things ready for the coming night, a hoodlum came up who tried to be funny. In order to prevent shocks I used a little platform of wood with glass legs.

The meddler, not observing this precaution against electrical shocks, commenced fingering things. I was about to shout to him the danger to which he was subjecting himself, when he got the electrical shock. It was a good one and the man was rolled quite profusely in the dust. When he got up he attempted to thrash me. I sought safety by liberally swaying a line of the wire in his face, telling him it carried the current in death dealing allotments. He believed me and went off cursing me. You cannot always tell what is going to occur to you when you start out in the morning to make the rounds. On short trips one may walk, while on long routes specially constructed vehicles of the light-trap pattern are employed. With the vehicle you can carry considerable of the supply truck, without the wagon you have to convey quite a load yourself and so are handicapped. I thought I would hire a lad to help me carry the kit along one day. Having occasion to ascend a pole, and while I was getting there he hopped on a passing car with the kit and got off before I knew what was going on. I later ascertained that he pawned the outfit at a junk dealer's shop for $2. The outfit was worth fully $25. On another day while carefully setting things to rights, and had about finished operations on a lamp, the lamp cord broke and the weighty glass globe with its metal trimmings came down in a hurry just back of my shoulders. I had to jump for it to clear the thing. Such little incidents are of daily occurrence in the career of the electrical light man as all of the fraternity know.

We never knew just when we were going to get burned. I have had light touches of electrical currents pass through me numbers of times in a week, and I suppose this happens because one gets careless and may let his thoughts wander from his work. When I first commenced working for the company I was more cautious. I did not let my mind wander to the entertainment or the theater of the evening, but kept my mind on the deadly wires and connections. I was careful to wear rubber gloves until the other fellows gave me the laugh. I fitted up rubber handles on the tools I used and this created much merriment among the men. Of course, all these fixings are now discarded by me. I am getting careless. Some day I will get a current through my body that will make me blink. It will be a good lesson. Of course, things come up often that one cannot avoid. A storm may be the means of putting the wires out of order on some building, up you go in a hurry, and the next thing that happens is that the owner of the property is after you. I have been taken for a burglar numerous times when clambering in the vicinity of windows on poles. The regular cap, and often the lineman's garb, fail to prove to suspicious persons that you are all right. They argue that you have borrowed the clothes for the purpose, that you are carrying a few tools to deceive, that you are waiting your chance to pick a diamond ring from the dressing stand and escape. The other day I was asked to make some explanations that riled me. I had repaired a switchboard in a house. The owner of the house reported by letter that a scarf-pin was missing. The pin had disappeared about the same time that I did.

I was advised to go back to the house and talk over the situation with the owner. I did so. After rummaging about for a time he himself found his pin in his washscarf, just where he had left it in the laundry bag. He appeased my feelings with a box of cheap cigars. I made him telephone to the company and explain the find. Some happenings arise that give one real shocks. There are risky places to ascend to mend wires, for you are expected to get everything on your section in running order as soon after a storm or break as possible. On one occasion I had to clamber to the edge of a roof to get at a peculiarly placed wire which carried the light current I wanted. The entire cornice of that building lopped off and I went with it. I came down good and fast into a hundred wires and bounced up a yard or more, once more to plant myself on the wires. There I remained fixed. Passers-by telephoned to the police and the police came and



encouraged me with talk. I did not feel like moving much for fear I would go through the net to the bricks below. Being up I could hear the conversation below very clearly and was pleased when it was recommended that an aerial ladder be summoned. In half an hour or less such a ladder was below me and it was worth much to witness proceedings from then on. I admired the firemen. They did not have much to say. They simply worked good and hard and soon the wonderful sky-scraping top of the strong, red, fire ladder commenced shooting up straight at me. It was great. The prongs were at hand in a few minutes and I let myself out of the wire net and on to the ladder, amid cheers from below, for the street urchins had commenced to collect. It was great sport. I got a write up next day. The credit went to the firemen. They earned it.

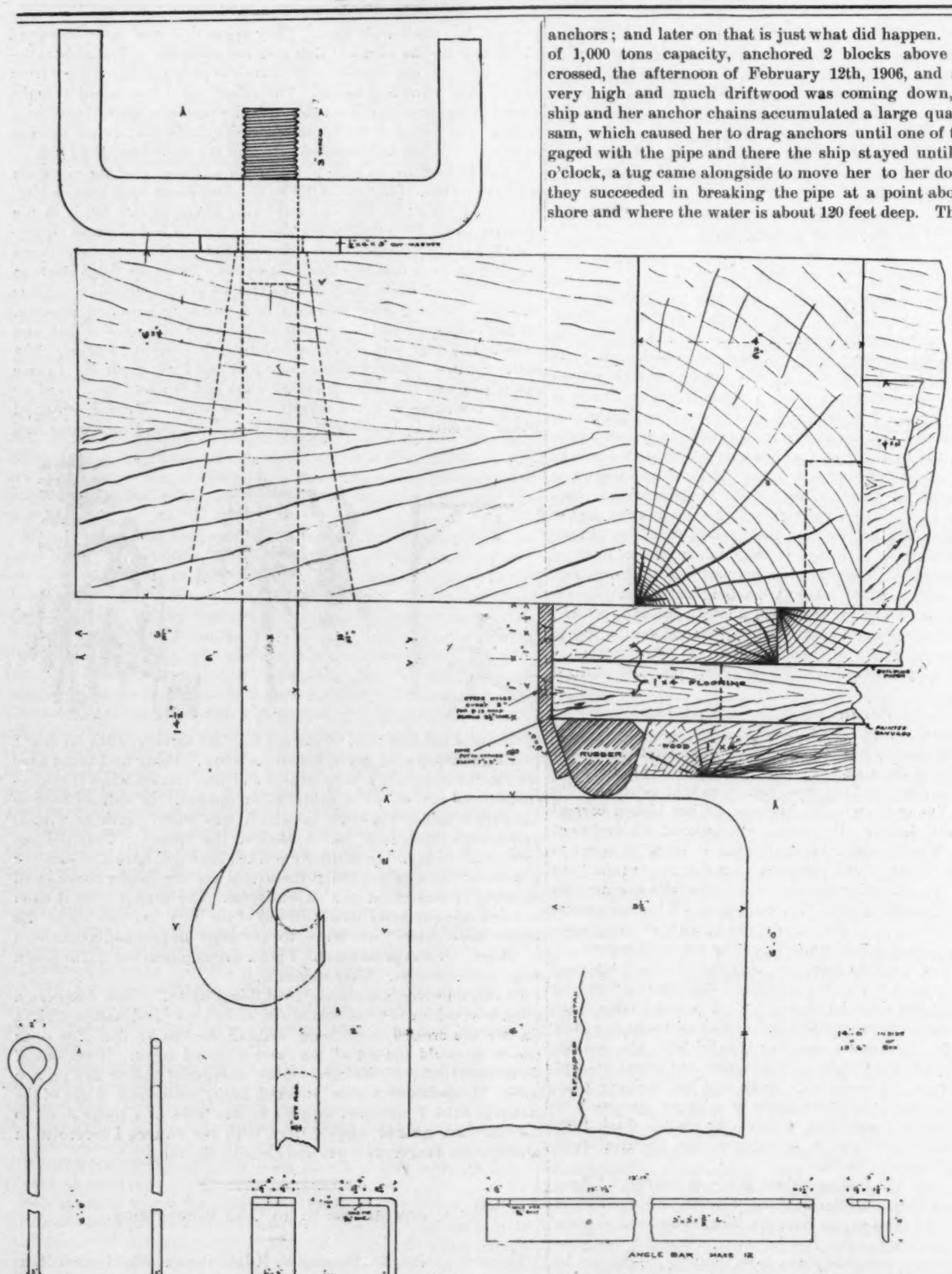
I have, however, done some good things alone. There had been a general smash-up of poles and wires, and at one combination high in the air the crossed wires were making the sparks fly. For some reason we could not get all the current closed down. It was one of those combination poles carrying all manner of public and private lines. By means of a rope attached to the cross-arms of one of the standing poles I managed to use a broken pole as a bridge to get to the confused mass of wires. Here, with the cutters, I succeeded in severing the dangerous wires and clearing the lines.

Quick Action in an Odd Emergency.

Those who know Mr. Thomas D. Miller, the capable General Manager of the New Orleans Gas Light Company, know that he is a thoroughly resourceful man. If proof of this were needed the following story would seem to furnish it.

That section of New Orleans, known as Algiers, is located on the bank of the Mississippi river opposite the city proper. Up to 1902, Algiers had no gas supply, which fact attracted the attention of Mr. F. H. Shelton, the Engineer of the New Orleans Gas Light Company at that time. It appealed to him so strongly in fact that he decided to supply this district by means of a submarine pipe. A full account of the laying of this main was given by Mr. Miller, in a paper read by him at the meeting of the Western Gas Association, May, 1903. A possible contingency that could not be completely guarded against (all others had been) was the hooking of the pipe by steamship

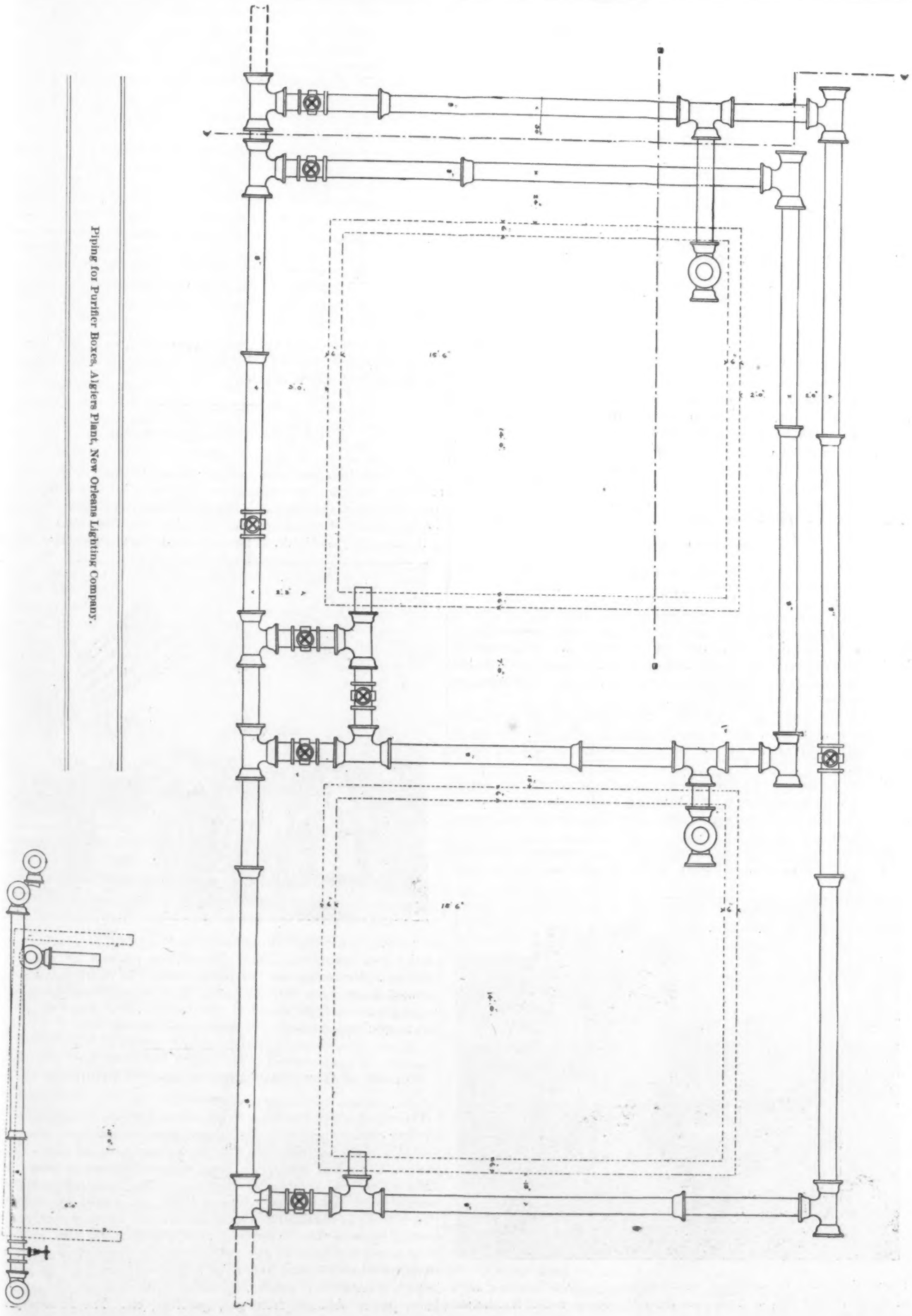
anchors; and later on that is just what did happen. A fruit steamer of 1,000 tons capacity, anchored 2 blocks above where the pipe crossed, the afternoon of February 12th, 1906, and as the river was very high and much driftwood was coming down, the bow of the ship and her anchor chains accumulated a large quantity of this flotsam, which caused her to drag anchors until one of them became engaged with the pipe and there the ship stayed until morning. At 6 o'clock, a tug came alongside to move her to her dock, and at 7 A.M. they succeeded in breaking the pipe at a point about 250 feet from shore and where the water is about 120 feet deep. This put the entire



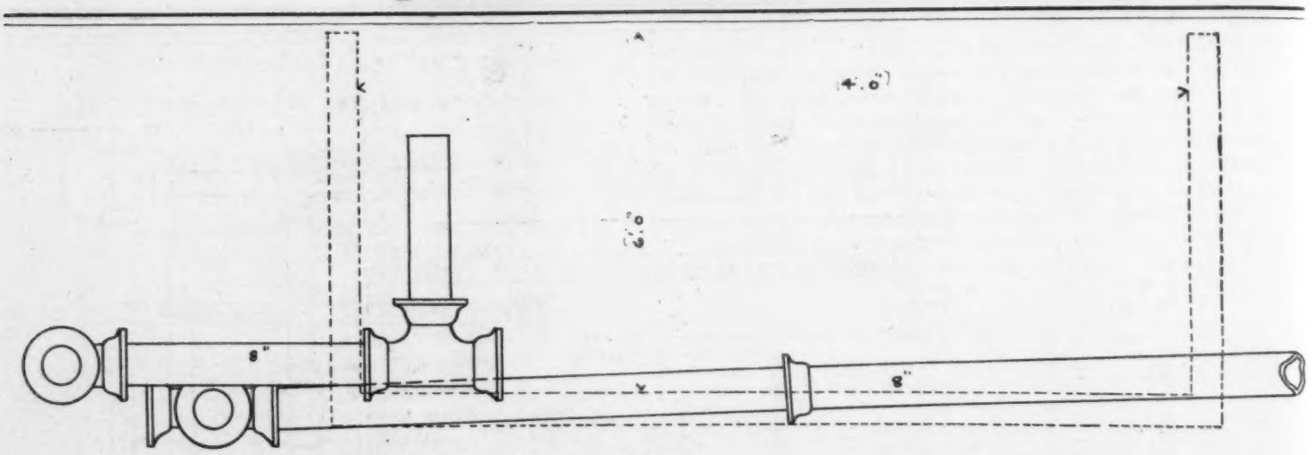
Two Purifier Boxes for Algiers Plant, New Orleans Lighting Company.

district out of gas and, as it was utterly useless to attempt repair or reinstall at that stage of the river, and as low water would not be until July, it was decided to build a small plant in Algiers as quickly as possible.

A 4-foot water gas set was ordered by telegraph from the most available manufacturer, and real estate was purchased for a site. A 50,000-foot holder was taken from the abandoned plant of the old Jefferson City Gas Company's works and installed in a steel tank built by a local firm. Boiler, engine, exhauster and condenser were also supplied from abandoned portions of the old plant. Purifying boxes had to be built and two cement boxes were designed with a view to making everything locally. The covers were made of wood and the only ironwork outside of the expanded metal was made in



Piping for Purifier Boxes, Algiers Plant, New Orleans Lighting Company.



Section B-B.

the Company's shop. The connections were made from standard 8-inch pipe and valves with bell and spigot joints. The illustrations show the planning and construction of the boxes.

The plant was in operation in 60 days from beginning work of tearing down the shanties on the property. It has been in operation constantly since, handling from 40,000 to 50,000 cubic feet of gas daily. The wooden covers are as good to-day as when first laid on, and the boxes are entirely satisfactory, in fact they bid fair to outlast those of iron construction. They are covered with a corrugated iron shed supported by wood construction. The buildings were erected after the plant begun operation.

Piping Times.

One of the most important undertakings now underway in the city of New York, to improve the traffic conditions, is the so-called subway loop construction. The structure known as the Williamsburg Bridge has been open for 3 years and over, but, owing to the fact that the connections on the New York approach have been inadequate, it has not carried its full quota of traffic.

The subway loop will connect this bridge with the old New York and Brooklyn Bridge, and a similar loop is being constructed in Brooklyn, so that trains will be run over one bridge and return on the other.

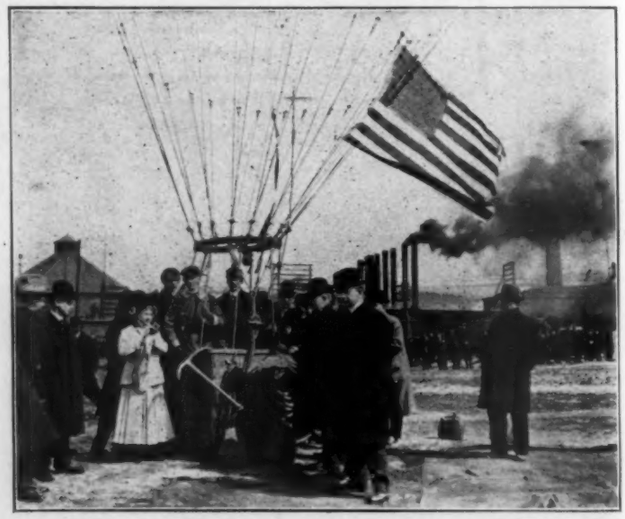
The city has acquired two blocks towards Center street just north of the New York entrance to the Brooklyn Bridge, and, according to the present plans, a 23-story municipal building is to be constructed upon the site.

The subway station will be located under the building and the excavation for the purpose is shown in the illustration. In has been

found necessary to continue maintaining the 36-inch water main along its former bed, as it supplies the entire lower end of Manhattan Island. It is now supported upon a temporary trestle and it will be left in its present location, being included through imbedding in the foundations of the new building.—"O."

Trial Trip, North Adams, No I.

The illustration shows the balloon, North Adams, No. I., just after receiving her baptismal appellation, and just prior to the flight made from the grounds of the North Adams (Mass.) Gas Light Company, the morning of March 20th. The ascension was made from the yards of the Company at 11 A.M. of the day noted and the descent was made



at 1:35 P.M., a landing being effected on Stony Hill at a point about 4 miles from Springfield, Mass. The balloon reached an altitude of 7,800 feet. No mishap marked the trial trip. In the foreground will be noted the presence of Col. Frank S. Richardson, whose prominence in the direction of the affairs of the Aero Club, of America, entitles him to speak by the card over matters balloonistic.

Report of Canadian Commission on Producer Gas.

The report of the Canadian Hydroelectric Power Commission, regarding producer gas and other power agencies, has been placed on the table of the Legislature. Besides dealing with all kinds of gas powers, the report also gives some statistics regarding steam, and there is a general comparative summary. This summary states that users of small amounts of power will be best served by electricity where it can be obtained at a price per electric horse power not exceeding by more than 15 per cent. to 25 per cent. the cost per brake horse power developed by gas, gasoline or oil. Users of large amounts of power where the load fluctuates, says the report, will be justified in paying for electric power 30 per cent. more than the cost per brake horse power obtained from gas, gasoline, etc. The summary adds

that where the cost of producer gas power per brake horse power does not work out 15 per cent. below the cost of hydroelectric power per electric horse power it will be advisable to use the latter.

The Commission finds that producer gas plants at present are only advisable for those power users having a fairly steady load, and who acquire fairly large quantities of power, or who use gas for other purposes, such as annealing. Regarding the future, it is stated that the increasing price of coal will probably allow producer gas plants to compete successfully with steam plants. This may even happen where exhaust steam is used for heating and manufacturing purposes.

Many pages of the report are taken up with tabulated statistics. It is found that with a 500 horse power producer gas engine running full load for 3,000 hours a year (10-hour day), the power cost $21.86 per horse power per year. Under the same conditions, with a 100-horse power engine, the cost is $27.32 per horse power per year; with a 50-horse power, $30.66; and with a 10-horse power, $64.70. If the conditions are changed so that the engine works 6,600 hours a year the cost would be with 500-horse powor, $36.50 per horse power per year; with 100-horse power, $45.54; 50-horse power, $51.32, and 10-horse power, $107.09.

The cost varies as the load varies, however, and in the report is a statement showing the cost when the engines are running at 75 per cent. of rated capacity. For the 10-hour day under such a load with a 500-horse power engine the cost of the power used would be $27.43 per horse power per year; 100-horse power, $34.62; 50-horse power, $39.58, and 10-horse power, $84.37. Working 6,600 hours a year at the same load figures are: 500-horse power, $45.22 per horse power per year; 100-horse power, $56.76; 50-horse power, $65.56; 10-horse power, $198.34.

This cost includes fixed charges, maintenance and repairs, labor, anthracite coal at $5 a ton, oil, waste and sundries. The fixed charges include interest on capital, invested at 5 per cent.; depreciation in machinery, 6 per cent.; depreciation on buildings, 2 per cent.; insurance and taxes, 2½ per cent., and repairs on building, 2 per cent.

The total capital cost, including building, etc., for a 500-horse power producer gas engine is placed at $35,162, while for a 10 horse power engine it is $1,867. The maintenance account for 500-horse power for a 10-hour day a year is placed at $618.24; labor, $1,200; and oil, waste, etc., $750. This fuel bill, of course, varies considerably with the load factor, though not proportionately. For a 10-hour day, the engine running at full load, the yearly fuel bill is given as follows: 10-horse power, $93; 30-horse power, $261; 50-horse power, $390; 100-horse power, $750; 300-horse power, $2,250; 500-horse power, $3,750.

To secure satisfactory results with producer gas, the commission report that it is necessary that a producer plant be suited to the conditions under which it works, and that a trained man be placed in charge of it.

In the summary of F. T. Stocking, one of the engineers engaged in the investigation, it is pointed out that, when costs are determined by small power users, the costs of fuel and attendance only are considered, while the charges against capital, repairs, failures of power, etc., are generally overlooked; and also that the load factor is generally neglected; costs are generally based on full load conditions, which in the average factory obtain only for a short time each day. He also said:

"A small gas plant, however, has the advantages over steam, in so far that no black smoke is emitted, costs for fuel and attendance are less, and also the total yearly costs, and the plant may be started, everything being cold, more quickly than the steam plant. The gas plant may be used to good advantage where continuity of service is not of prime importance, and where electric power cannot be obtained or where the cost of such power is excessive."

Mr. Emil Stern, another engineer employed on the report, says in part:

"Generally speaking, producer gas is being introduced slowly but steadily. Like every new thing it requires time for development, and we may trust that it will shortly be allowed to take its part in Canada's power generation as it already does in England and other European countries, helping to increase the industry and manufacturing capacity of our country."

Mr. L. W. Wartena has resigned the post of Superintendent of the Michigan City (Ind.) Gas and Electric Company to assume charge of the Geist properties near Chicago.

Bureau of Information, The American Gas Institute.

Bureau of Information,
The American Gas Institute,
Headquarters, 716 Locust Street, St. Louis, Mo.
W. A. Baehr, Chairman.

[Concluded from Page 750.]

ANSWER-AT-LARGE.

The following answer-at-large was received from Mr. Frederick Egner, Norfolk, Va.:

In this question you have briefly, but comprehensively, described three styles of retort houses, limiting the operations and results closely and leaving nothing to be answered but, "What difference of candle power and heat units may reasonably be expected in the finished product of the three works, because of their varying factor of retort lengths; and what are the reasons for this opinion?"

While in the course of my practical life I have had charge of operations of coal gas works, ranging from one with only 2 benches of "threes," making not over 18,000 cubic feet of gas per 24 hours, from very poor Missouri coal, up to works with 840 retorts in action, using good Pennsylvania gas coals and with direct-fired, generator heated, and recuperator furnaces, and some with stoking machinery, I have had no experience in three such works as are described in the Bureau's question, and only one who has had this experience could possibly answer the question with some degree of certainty. I have, of course, visited and talked with men who have operated one or another of the types you describe and have found that "Doctors differ" in their opinions on the subject, and with considerable vehemence assert their point of view.

Your question is, as I see it, purely a theoretical one which, because of the reasons I have given. I feel unwarranted to venture to decide; but, if you will permit me, I beg leave to say that, in view of the now well-demonstrated fact that all of our old knowledge relating to what is going on in a retort where coal is being coked and gas evolved is a knowledge of what has been—but better had not be continued to be done—it appears a mere waste of valuable time to speculate upon the Question No. 8 submitted to your Bureau.

I now refer to the clear, thoroughly established results with the vertical or standing retort system, as first operated at Dessau, then Berlin, Cologne and many other cities, where it is shown that, with a retort house occupying no greater ground space and costing not much more, and with a retort system alleged to cost no more per unit of gas produced, the results are: First, better gas from the same kind of coal; 2d, better and more coke: 3d, better and more tar; 4th, more ammonia, from 35 per cent. to 55 per cent.; 5th, fifty per cent. less sulphur compounds to be removed from the purifiers; 6th, no naphthaline at all; 7th, no stopped standpipes; and, 8th, the utmost possible economy in labor. As, by reason of the difference in position of the retorts and consequent difference in the chemical changes going on in the vertical as compared with the horizontal retort, these magnificent results are obtained, I think it just a waste of time to discuss the horizontal retorts in any shape, with or without machinery, for large, medium or small works, and the sooner all concerned will wake up to these facts the better for gas companies and their stockholders.

Revised Questions.

Question No. XIV., as originally published was:

"How many gallons of ammoniacal liquor of 10-ounce strength is it possible to obtain from the various gas coals in the United States? This information is desired in particular for Pittsburgh, Virginia, West Virginia and Tennessee coals."

Its revised form is appended:

"How many gallons of ammoniacal liquor of 10-ounce strength is it possible to obtain from the various gas coals in the United States? Assume that the different coals are used in the ordinary gas retort and that a good commercial yield is obtained from each particular coal in question. This information is desired in particular for Pittsburgh, Virginia, West Virginia and Tennessee coals."

Question No. 15 as originally published in the Journal was incorrect. The accurate revision is:

"What is the process adopted, and standard, for testing the candle power of coal gas? Would a 'Knott Jet Photometer' give as close a

test as the process above referred to? If not, how close, approximately?"

"Is 16-candle power coal the most economical for the consumer, both for fuel, and for light, used in mantle burners? Would a change from 16-candle power of coal gas either lowering or raising same, favor the consumer for fuel and lights, or would the above change benefit the fuel gas and be a detriment to the illuminating; or *vice versa*?"

Additional questions are:

No. XIX.—"Given any typical American city of 150,000 population and upwards, which is constantly growing at a rate which will show an increase of population of at least 25 per cent. every 10 years, and assuming—

"(a). There is no gas plant in the city.

"(b). That a corporation, having ample resources, wishes to install a gas plant in this city.

"(c). That this corporation desires to start with a gas distribution system which can readily expand to meet the constantly increasing demands of the city.

"(d). That the corporation is governed by a policy through many years to permit following the given distribution plan absolutely as required.

"(e). That the use of gas will expand at about the same rate as it had since the year 1900.

"(f). And that this corporation is willing to go to any reasonable expense in the installation of the best distribution system that can be devised and be a commercial success; then question:

"What is the best distribution system to install? Give reasons and such general calculations which will show why you formed that conclusion. Consider the following kinds of gas distribution and any other types that may occur to you:

"(1) Low pressure from gas works.

"(2) Low pressure, installing district holders as city grows, pumping gas to district holder in any way you wish to calculate.

"(3) Low pressure, with medium pressure re-inforcement, say up to 10 pounds per square inch, with district holders, and pumping plants at district holders for use during peak load, and with governors feeding into the low pressure system at given distances upart, in addition to regular low pressure supply from plants and holders.

"(4) Same as (3) without district holders, and all pumping at gas plants.

"(5) Medium pressure, say up to 10 pounds per square inch on entire system, with governors before each meter. No district holders.

"(6) Low pressure with feeders carrying, say, from 10 pounds to 60 pounds per square inch, with governors feeding into low pressure general system at given distances apart, and without district holders, all compressing being done at gas plants.

"(7) Same as 6, except using district holders with compressing plant for peak load use, and governors feeding into low pressure system as in 6.

"(8) High pressure, say from 10 pounds to 60 pounds per square inch on entire system, with individual governors on each service. No district holders.

"(9) Such other systems as may occur to you.

"It is to be understood that this is a general question and not one for a consulting engineer. Assume the usual conditions of electrolysis incident to American cities.

No. XX. "How many pounds of water, at a feed-water temperature of 60° F., can be converted into saturated steam at 150 pounds gauge pressure per 1,000 cubic feet of water gas made, corrected to 60° F. and 30 inches barometer, by placing a tubular boiler on top of the superheater, and passing both the blast gases and carburetted water gas through it, assuming a boiler efficiency of 75 per cent., and under reasonable assumptions of operating conditions?"

No. XXI. "Under ordinary conditions of low pressure distribution, what drop in gross B.T.U. per cubic foot would you expect per mile from works holder, when making water gas only, and during the winter season, with the atmosphere at an average temperature of about 32° F.? What, when making half coal gas and half water gas? What, when making one-third coal gas and two-thirds water gas?"

No. XXII.—"Can you give an instance of attempts made in any city of the United States, outside of Philadelphia, where the gas company endeavors to preserve a constant candle power throughout the distribution system within reasonable limits, and under all conditions of weather and temperature? If the gas is water gas, or mixed coal and water gas, how is this accomplished?"

Items of Interest
FROM VARIOUS LOCALITIES.

MR. JOSIAH APPLETON, for many years in the employ of the Brockton (Mass.) Gas Light Company, has been appointed to manage its new business division.

MANAGER H. T. SLOPER, of the New Britain (Conn.) Gas Light Company, has at last succeeded in convincing his Directors that it would be a wise move to exercise the Company's right to extend its mains to and through the outlying thriving settlement of Berlin. Truly, Mr. Nettleton and the New Haven Company have set the Connecticut Companies good example.

"MR. S. E. W. WOLFF, whose resignation as General Manager of the Saginaw City (Mich.) Gas Company has been heretofore noted in the JOURNAL, in order that he may assume an important position with the parent Company in New York, was the guest of honor at a banquet tendered by 20 of his friends and business associates. The function was brought off in the beautiful dining room of the East Saginaw Club, the evening of the 25th ult., and I am sure I am not wide of the truth when I say that a prettier, wholesomer or more fraternal wish-you-good-luck session was never held elsewhere. We are sorry that he leaves us, but that sorrow is tempered by our satisfaction over knowing that he goes on to greater things.—R. V. R.'

HERE is the new schedule on account of electrical current supply recently made operative by the La Fayette (Ind.) Gas Company:

Lighting, Per Month, Quantity.		Lighting, Per Month, Quantity.	
1 to 25 kilowatts	9 cents per kw.	200 to 400,	8 cents.
26 to 50 "	8.75 " "	401 to 1,000,	7½ "
51 to 100 "	8.50 " "	1,001 and over	7 "
101 to 200 "	8.25 " "		

Power, Per Month, Quantity.		Power, Per Month, Quantity.	
1 to 100 kilowatts,	8 cents per kw.	1,001 to 2,500,	4 cents.
101 to 200 "	7 " "	2,501 to 5,000,	3½ "
201 to 400 "	6 " "	5,000 and over	3 "
400 to 1,000 "	5 " "		

A discount of 10 per cent. is given when bills are settled on or before the 10th of the following month. The schedule for fans is also appended: One ceiling fan, $2.25 per month; more than one ceiling fan, $2 each; one desk fan, $2; more than one, $1.75; ceiling fans, per season, $9; desk fans, per season, $8. Prompt payments, as before, 10 per cent. off.

THE reflex system of window lighting, recently installed in the show windows of the Brandon-Durrell store—a prominent retail shop in South Bend, Ind.—has attracted and is attracting more attention than any other advertising device ever exhibited in that city. The fittings required 16 lamps, each of 250-candle power.

MR. A. G. ALEXANDER informs us that, in order to improve its office facilities, its headquarters (including the laboratory) have been removed to 271 to 285 Madison street, Chicago. It may look like putting the cart before the horse, but the name of the concern that has made this removal is the Sargent Steam Meter Company.

"DEAR JOURNAL: Why don't you publish something about that visit of the employees of the Kalamazoo (Mich.) Gas Company to Masonic Hall in Galesburg, Ills., the evening of the 22d ult.?" Not having heard anything about it until our correspondent's question came to hand would seem a sufficient answer.

THE authorities of Lewisburg, Pa., by means of an ordinance recently considered, have succeeded in placing themselves between the devil and the deep sea. Under the ordinance the local Gas Company will be called upon to pay an annual tax of $30 per mile on its street mains, whereupon the Company asserts that if the ordinance is enforced it will be obliged to make a sensible addition to its net selling rate. The latter is $1.90 per 1,000 cubic feet.

THE Rockford (Ills.) Gas Light and Coke Company has awarded to the Gas Machinery Company, of Cleveland, O., contracts for the installing of the following apparatus during the month of June: Suitable dry seal purifiers, an oxide elevator and connections, and a 36-inch ammonia concentrator. The Gas Machinery Company's folks have their plant in excellent working condition and are prepared to take on work requiring completion for very near deliveries.

PRESIDENT F. M. SACKETT and his fellow executives of the Louisville (Ky.) Gas Company are to be congratulated on the success of the bond sale recently completed under their direction. The issue consisted of $200,000 of 5 per cent. bonds, due 1918, which were offered at public subscription. The award of the entire issue was made to the Fidelity Trust Company, at its bid $1,001.01 per 1,000. In the face of the prevailing financial conditions the result is certainly surprising, and speaks well for the faith reposed in the stability of the Company by the investing public of Kentucky. Mr. Sackett's management of the Company since his accession to its Presidency has been of the soundest sort; no fireworks, no noise, no unsteadiness—in fact, it has been and is of the kind that attracts confidence and holds it.

MR. HOMER M. EATON assumes charge to-day of the superintendency of the gas division of the properties of the Saginaw and Bay City (Mich.) Railway and Light properties. Of course, Mr. Eaton will make his headquarters in Saginaw, and we also take it for granted that it is pretty well known his former field of duty was in Jackson, Mich.

MR. J. H. MAXON, of Athens, Ga., has been appointed General Manager of the Bessemer (Ala.) Gas Light Company's works.

WE regret very much to have to report the sudden death of Mr Nathan Brooke Dolan, son of Mr. Thomas Dolan, President-elect of the United Gas Improvement Company. The suddenness of his demise may be comprehended when it is narrated that it occurred at his father's home, 1809 Walnut street, Philadelphia, just atter his having returned from a protracted shooting trip, which he enjoyed most heartily. He was in his 44th year, was unmarried, and was a noted favorite in the best social life of his native city.

THE gas plant at Magherafelt, County Derry, Ireland, is under the direct and active superintendency of an unmarried woman named Mary M. Richmond. It is further averred that she is entirely successful. She is somewhat to the manner born, her father having been a trusted employee of the Kilkenny Gas Company.

THE Washington (D. C.) Gas Light Company's last quarterly dividend of 2½ per cent. has been payable since the 1st inst.

THE Pittman and Glassboro (N. J.) Gas Company is extending its main system to the outlying village of Elmer. The length of the run is a trifle over 5 miles.

THE Gas Bench Construction Company, of St. Louis, Mo., has on its books contracts for bench installation in the following gas works' situations: Cooperstown and Kingston, N. Y.; Columbus, O.; Peru and Kendallville, Ind.; Columbus, Ga.; Pontiac, Ills. This would seem to indicate that the Company is getting at least its quota of that which is being sent out in the construction line during these rather listless times.

"F.," WRITING from Suffolk, Va., under date of the 4th inst., says: "Everything is moving along as well as could be expected in a new plant. We set about 160 meters and connected up 91 stoves during the month of April; and we can see quite a good share of other new business in line to be assumed before June 1st."

THE returns of the business done by the Providence (R. I.) Gas Company to the City Treasurer for the quarter ended March 31, 1908, shows a gross receipt of $279,880.31. For the corresponding quarter of 1907 the figures were: $285,156.50. For the corresponding periods the returns made by the Narragansett Electric Lighting Company were: 1908, $241,359.68; 1907, $251,214.26. The respective shrinkages for the quarter were: Gas, $5,276.19; electricity, $8,854.58.

THE Philadelphia *Bulletin* furnishes the following facts and figures respecting the annual meeting of the United Gas Improvement Company, held in Philadelphia last Monday. The meeting was directed by Mr. Samuel T. Bodine, Vice-President and General Manager of the Company. The yearly reports among other things showed a net profit for the year of $6,001,146, of which $3,663,136 were returned to the shareholders in the shape of dividends and $2,388,010 were carried to undivided profit account. The requirements of the Philadelphia gas works and other leased properties, and of the various Companies in which the U. G. I. is a shareholder, for construction account during the year totalled $2,852,752, which will be largely expended on distribution account—mains, meters, etc. The sales of gas on account of the Philadelphia plant showed a percentage gain for the year of 7.27, and for all the other U. G. I. Companies—on gas account, gain, 12.4 per cent.; on electric account, 7½ per cent. Treasurer Lillie reported assets amounting to $67,834,966, and noted that the liabilities included undivided profits of $19,459,759. The report, referring to the Company's plants had this to say: "The physical condition of the Philadelphia Gas Works and the business methods here employed are typical of all the properties in which the United Gas Improvement Company is interested. If, therefore, you will inspect the manufacturing plants, holders, storerooms, shops and offices in Philadelphia and examine the list of stocks and bonds verified by the Directors' Committee, all of which can be readily done upon application to the First Vice-President, you will be able to form a very intelligent judgment as to how your business is managed and as to the location and value of your investments." The officers were all re-elected.

THE offices of the Connelly Iron Sponge and Governor Company have been removed to the Hudson Terminal Building, New York city. "Governor" Hayward's latest souvenir, by-the-way, is a neat miniature blotting pad, which carries this inscription: "Lest you forget our new address."

WRITE to Mr. M. M. Milton, Secretary of the Consolidated Gas and Electric Athletic Association, Lexington and Liberty streets, Baltimore, Md., if you desire to know anything about the schedules which have been arranged for this season by the baseball team thereof.

THE authorities of Manchester, Mass., are considering the advisability of taking over the plant of the local electric lighting enterprise for operation on municipal account.

AT the annual meeting of the Denver (Col.) Gas and Electric Company, which is set for to-morrow, the shareholders will be called to accept or reject a proposition for the providing of a sinking fund to retire on maturity the $8,000,000 bond issue sanctioned in 1903. It is also thought likely that the proposition to purchase the local structure, known as the Majestic Building, for the general offices of the Company, will be sanctioned. We are told that the owners of the Majestic will not accept less than $700,000 for the property.

MRS. HELEN ARMSTRONG concluded last week a series of demonstratory lectures on cooking by gas under the auspices of the Noblesville (Ind.) Gas and Improvement Company. As usual, the lecturess made good in no uncertain fashion.

THE United Gas Improvement Company has arranged for the construction of a storage holder up to retaining 3,000,000 cubic feet, at the corner of Atlantic and Venango streets, Philadelphia.

"F. G. S.," writing from Kalamazoo, Mich., under date of the 2d inst., says: "With much sorrow I report to you the death of Mr. David H. Haines, Treasurer of the Kalamazoo Gas Company, who passed away the morning of Sunday, April 26th. His death was altogether unexpected, as he had been in the best of good health apparently the night preceding. Apoplexy was the cause. Deceased was in his 64th year, having been born May 27th, 1844. His family have been prominent in the affairs of Kalamazoo since the close of the Civil War, in which struggle he was a member of the Fourth Michigan Cavalry, which troop was especially noted for having captured Jefferson Davis at his place of refuge in Gainesville, Ga. When the Fourth Cavalry was mustered out Mr. Haines engaged in the hotel business, and acted as Manager of the Belvidere Hotel, Charlevoix, Mich. Later he was Secretary of the Merrill-McCourtie Milling Company, and in 1901 he was elected Treasurer of the Kalamazoo Gas Company. He was well liked. He is survived by his widow, a son (Donald H., now a student in the University of Michigan) and a brother, Mr. Horace G. Haines, also a resident of Kalamazoo."

THE Citizens Gas Company, of Indianapolis, Ind., has appointed Mr. George Summers, formerly in the service of the Peoples Gas Light and Coke Company, of Chicago, as its General Superintendent. If we mistake not Mr. Summers was at one time prominent in the construction division of the Brooklyn (N. Y.) Union Gas Company.

BEGINNING the first inst., the districting arrangement for the payment of accounts for gas and electric lighting current, furnished by the Consolidated Gas, Electric Light and Power Company, of Baltimore, Md., became effective. The respective branches of the Provident Savings Bank (there are 11 of these, and so situated that they center in the business districts of the various sections) are constituted paying stations, and hereafter none may growl over their inability, through distance between their houses and the Company's office, to secure the full discount on gas or electric current bills, to settle such within the stipulated time. Secretary Cohn, Treasurer Bailey and their assistants, have to a certainty mapped this work out in simple yet thoroughly effective fashion.

At the annual meeting of the Lambertville (N. J.) Gas Company the officers elected were: President, Robt. Coryell; Treasurer, Frank W. Van Hart; Secretary, Albert D. Anderson; Supt., G. W. Massey. The others on the Board of Directors are Messrs. John Lily, Wm. Lily and Geo. L. Romine.

THE AMERICAN GAS LIGHT JOURNAL

A. M. CALLENDER & CO.,
PROPRIETORS.

THOS. J. CUNNINGHAM,
ELBERT P. CALLENDER,
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NOTIFICATION RESPECTING ADVERTISING.

Orders for new advertising, or for changes in standing advertisements, to insure attention in the issue following their reception, must be in hand any time of Wednesday.

MONDAY, MAY 11, 1908.

The Market for Gas Securities.

There is virtually no change in quotations for city gas shares, although the tendency is downward. The opening figures in Consolidated this morning (Friday) were 119¼ to 119¾. Brooklyn Union is dull and steady. The bond market was quite active, and some good advances were scored, notably in New Amsterdam 5's.

Peoples, of Chicago, went up steadily. It is again past the 90 mark. It will easily make 100 before July first. The Massachusetts issues are also improving. They look remarkably tempting at the quoted prices.

Gas Stocks.

Quotations by George W. Close, Broker and Dealer in Gas Stocks.

16 WALL STREET, NEW YORK CITY.

MAY 11.

☞ All communications will receive particular attention.

☞ The following quotations are based on the par value of $100 per share:

N. Y. City Companies.	*Capital.*	*Par.*	*Bid.*	*Asked.*
Consolidated	$73,177,000	100	119¼	119⅜
Central Union Gas Co.—				
1st 5's, due 1927, J. & J.	3,000,000	1,000	92	97
Equitable Gas Light Co.—				
Con. 5's, due 1932, M. & S.	1,000,000	1,000	—	105
Mutual	3,500,000	100	—	170
New Amsterdam Gas Co.—				
1st Con. 5's, due 1948, J. & J.	11,000,000	1,000	90	95
New York & Richmond Gas Co. (Staten Island)	1,500,000	100	37	43
1st Mtg. Gold Bds. 5 p. ct.	1,000,000	—	98	104
New York and East River—				
1st 5's, due 1944, J. & J.	3,500,000	1,000	100	105
Con. 5's, due 1945, J. & J.	1,500,000	—	97	101
Northern Union—				
1st 5's, due 1927, J. & J.	1,250,000	1,000	90	98
Standard	5,000,000	100	70	100
Preferred	5,000,000	100	100	125
1st Mtg. 5's, due 1930, M. & N.	1,500,000	1,000	100	105
The Brooklyn Union	15,000,000	1,000	108	110
1st Con. 5's, due 1948, M. & N.	15,000,000	—	91½	92
Yonkers	299,650	500	120	—
Out-of-Town Companies.				
Bay State	50,000,000	50	1	1 1-16
" Income Bonds	2,000,000	1,000	—	75
Binghampton Gas Works	450,000	100	—	65
" 1st Mtg. 5's	500,000	1,000	95	100
Boston United Gas Co.—				
1st Series S. F. Trust	7,000,000	1,000	82	85
2d " " "	3,000,000	1,000	47½	50
Buffalo City Gas Co.	5,500,000	100	5	8
" " Bonds, 5's	2,250,000	1,000	63	66
Capital, Sacramento	500,000	50	—	35
Bonds (6's)	150,000	1,000	—	—
Chicago Gas Co. Guaranteed Gold Bonds	7,000,000	1,000	104	106¼
Cincinnati Gas and Electric Co.	29,500,000	100	89¾	90
Columbus (O.) Gas Co., 1st Mortgage Bonds	1,500,000	1,000	92	98
Columbus (O.) Gas Lt. & Heating Co.	1,682,750	100	87	88
Preferred	3,026,500	100	81	82
Consumers, Toronto	2,000,000	50	200	204
Consolidated, Baltimore	11,000,000	100	—	105
Mortgages, 6's	3,600,000	—	—	118
Chesapeake, 1st 6's	1,000,000	—	—	—
Equitable, 1st 6's	910,000	—	—	—
Consolidated, 1st 5's	1,490,000	—	—	112
Consolidated Gas Co. of N. J.	1,000,000	100	15	17
Con. Mtg. 5's	880,000	1,000	92	95
Bonds	75,000	—	—	100
Denver Gas and Electric	—	—	74½	75
Detroit City Gas Co.	6,000,000	50	—	50
" Prior Lien 5's	4,618,000	1,000	—	98
Detroit Gas Co., 5's	281,000	1,000	75	80
" Inc. 5's	16,000	100	98½	100
Equitable Gas & Fuel Co., Chicago, Bonds	2,000,000	1,000	—	101
Essex and Hudson Gas Co.	6,500,000	—	30	40
Fort Wayne	2,000,000	—	—	—
" Bonds	2,000,000	—	55	—
Grand Rapids Gas Lt. Co., 1st Mtg. 5's	1,225,000	1,000	104½	105
Hartford	750,000	25	190	200
Hudson County Gas Co., of New Jersey	10,500,000	—	100	105
" Bonds, 5's	10,500,000	—	101	102½
Indianapolis	2,000,000	—	60	70
" Bonds, 5's	2,650,000	—	104½	105
Jackson Gas Co.	250,000	10	82	—
" 1st Mtg. 5's	290,000	1,000	97	100
Kansas City Gas Light Co., of Missouri	5,000,000	100	—	26
Bonds, 1st 5's	3,822,000	1,000	102	104
Laclede, St. Louis	10,000,000	100	—	100
Preferred	2,500,000	100	80	90
Bonds	10,000,000	1,000	104	104¼
Lafayette Gas Co., Ind.	1,000,000	100	—	60
Bonds	1,000,000	1,000	60	65
Louisville	2,370,000	50	143	145
Madison Gas & Elec. Co.				
" 1st Mtg. 6's	350,000	1,000	106	108½
" 6 per cent. scrip, due 1910	100,000	25	60	60½
Massachusetts Gas Companies, of Boston	25,000,000	100	51½	52⅛
Preferred	25,000,000	100	86¾	87
Montreal, Canada	2,000,000	100	218	218¾
Nashville Gas Lt. Co.	1,000,000	100	110	—
Newark, N. J., Con. Gas Co.	6,000,000	—	58	58
Bonds, 6's	6,000,000	—	137	138
New Haven	2,000,000	25	200	—
Peoples Gas Lt. & Coke Co., Chicago	25,000,000	100	90	90¼
1st Mortgage	20,100,000	1,000	—	—
2d "	2,500,000	1,000	104	—
Rochester Gas & Elec. Co.	2,150,000	50	88	—
Preferred	2,150,000	50	118	—
Consolidated 5's	2,000,000	—	104¼	105½
San Francisco, Cal.	15,500,000	—	—	—
St. Joseph Gas Co.—				
1st Mtg. 5's	751,000	1,000	92	—
St. Paul Gas Light Co.	1,500,000	100	45	47
1st Mortgages, 6's	650,000	1,000	113	116
Extension, 6's	600,000	1,000	112½	115
General Mortgage, 5's	2,485,000	1,000	96¼	—
Syracuse, N. Y.	1,375,000	100	50	55
Bonds	2,047,000	1,000	102	—
Washington, D. C.	2,600,000	20	346¼	353
1st Mortgage, 6's	600,000	—	—	—
Western, Milwaukee	4,000,000	—	—	—
Wilmington, Del.	600,000	50	230	—

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(Continued on page 810.)

WANTED,
Position as Manager

Of a gas, or gas and electric company.

1717-1 Address, "S. M. K.," care this Journal.

WANTED,

Position as Manager or Superintendent of Gas and Electric Company,

In city of 20,000 to 50,000 population, by man competent to take entire charge. Strictly sober, energetic, thoroughly drilled in each department of operation and business, 36 years old, married, exc llent references. At present superintendent of works of large Western gas company.

1715-4 Address, "W. R. S.," care this Journal.

Position Wanted.

Superintendent or manager, especially well versed in construction and new business methods, with successful record, desires a position with gas company. Has had wide practical experience in the operation of both coal and water gas processes.

1714-3 Address, "F. T. S.," care this Journal.

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1716-4 Address, "PRACTICAL," care this Journal.

Position Wanted.

Young man, 25, college education, good coal gas and some water gas manufacturing experience, good distribution experience, desires to connect with a company where by work he can earn a training and advancement. Address, "A. R. P.,"

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As Manager or Superintendent.

Am 29 years old, have had 10 years' practical experience in the manufacture and distribution of coal and water gas. Thoroughly conversant with accounting and commercial end of the business. Best of references.

1718-2 Address, "B. G. W.," care this Journal.

WANTED,

Position as Manager, Superintendent or Engineer.

A young married man, who has had nine (9) years' practical experience in office systems, distribution, operation and construction of both coal and water gas properties. Prefers in city of 20,000 to 50,000 population, either North or South. Party is a draughtsman and can handle transit and leveling instruments.

1718-3 Address, "XOR," care this Journal.

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Five years in meter repair shop, three years in the laying of mains and services, seven years in retort house and exhaust and boiler room; in fact, good in any and every department. Best of references as to ability and reliability.

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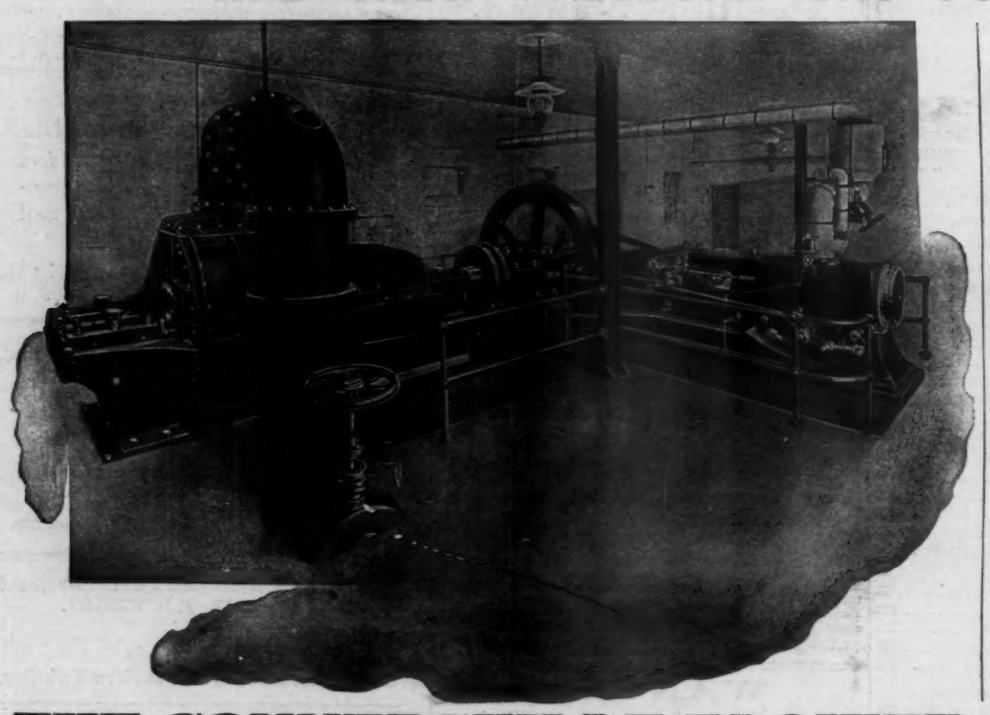

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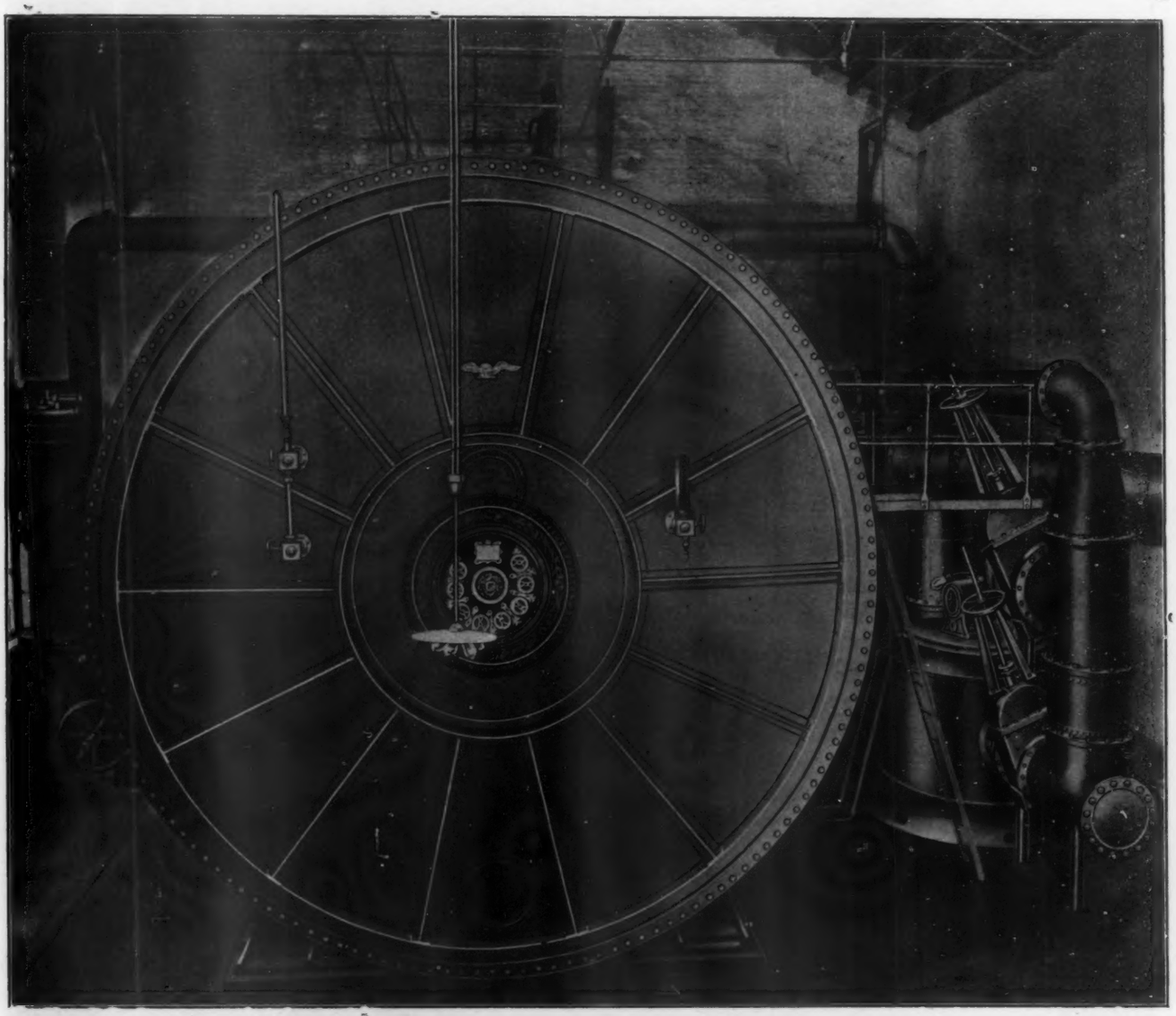

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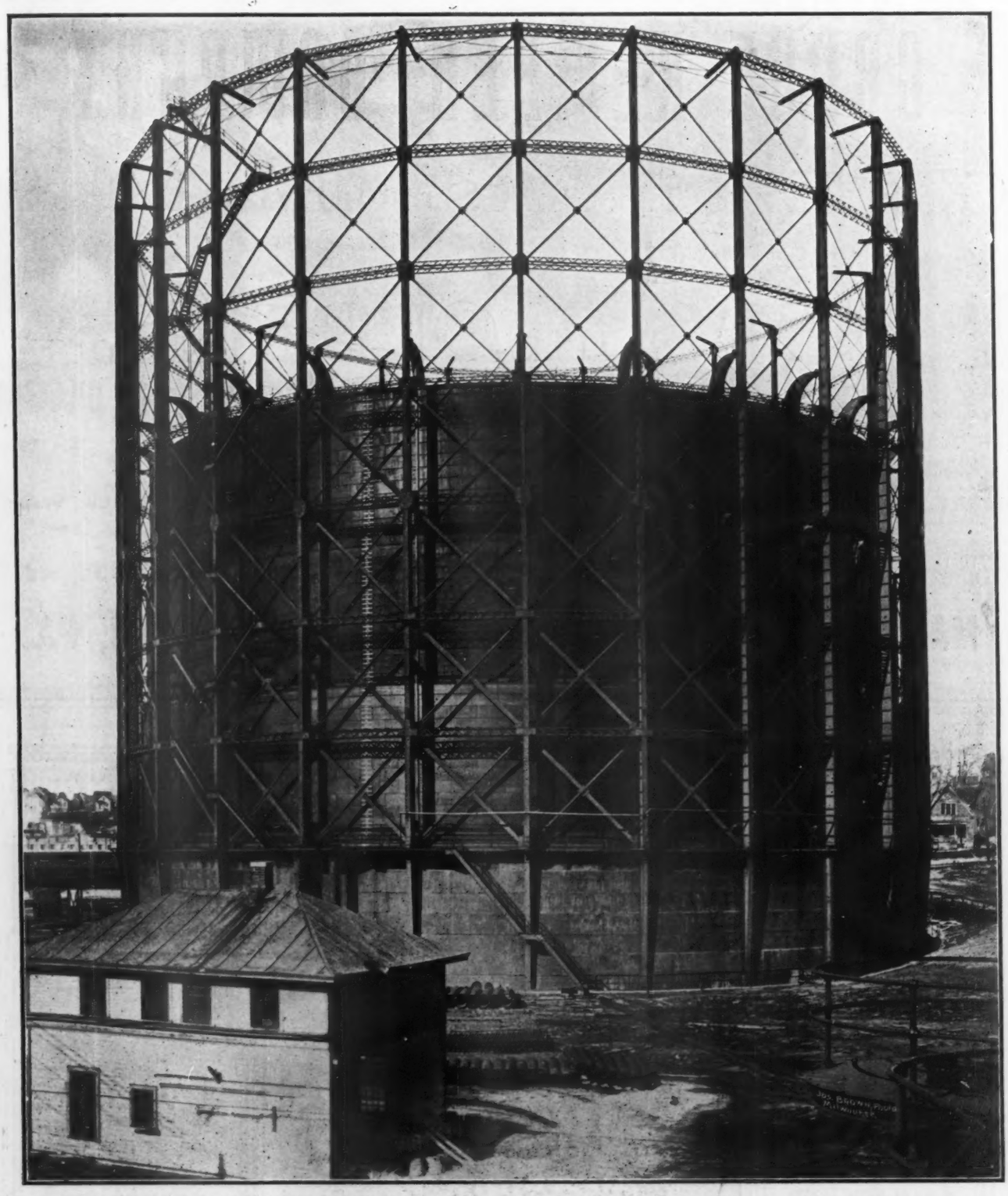

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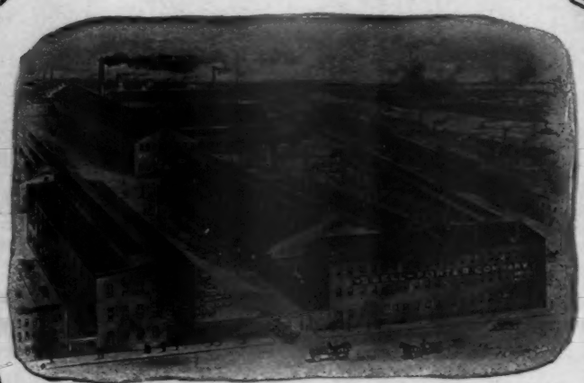

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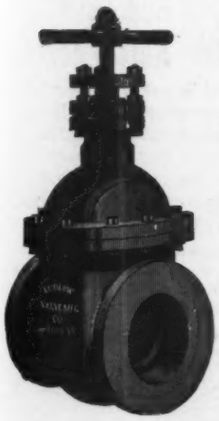

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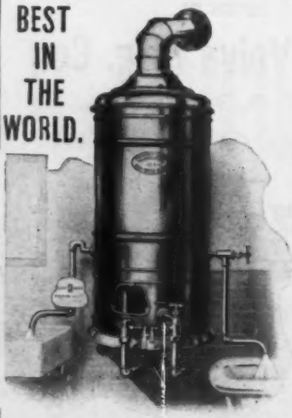

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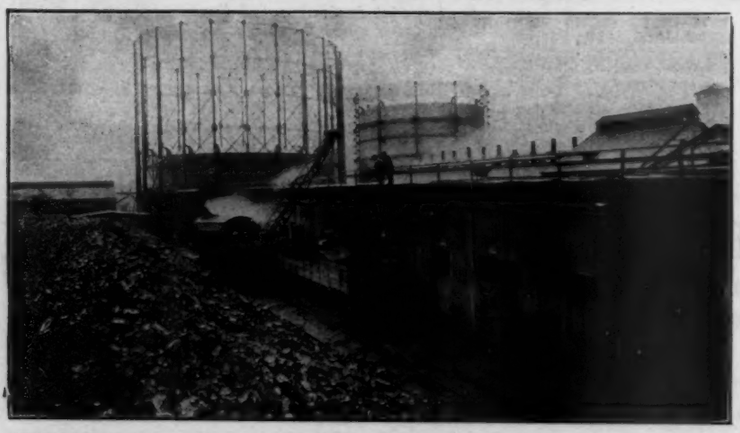

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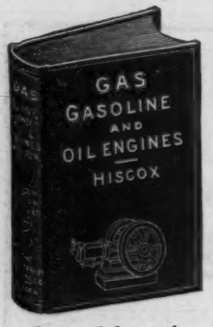

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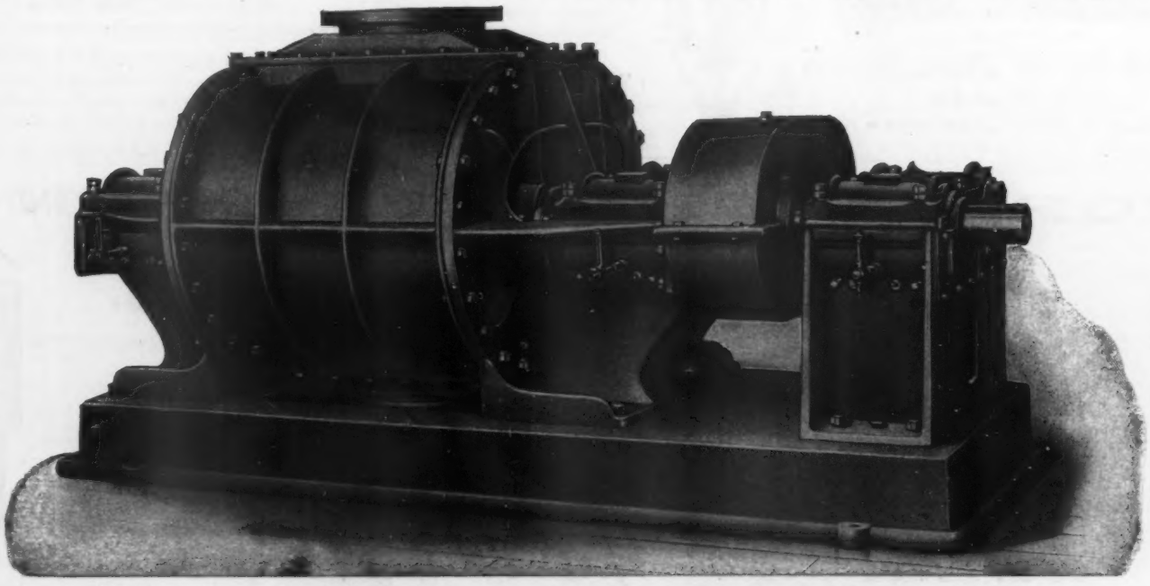

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Photometrical and Experimental Apparatus.

PUBLIC LIGHTING TABLE.

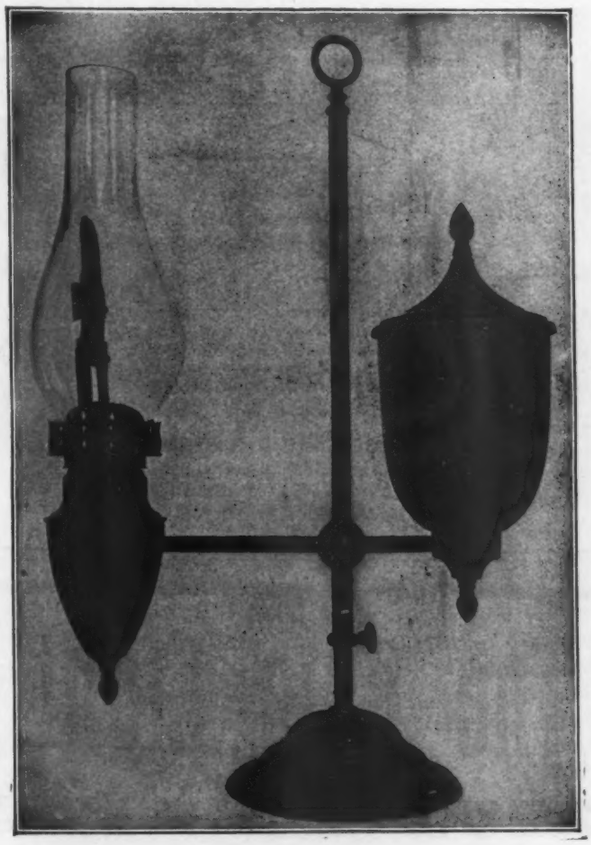
MAY, 1908.

Day of Week.	Date.	Table No. 1. FOLLOWING THE MOON. Light.	Extinguish.
Fri.	1	7.20 PM	4.00 AM
Sat.	2	7.20	4.00
Sun.	3	7.30	3.50
Mon.	4	7.30	3.50
Tue.	5	11.00	3.50
Wed.	6	11.40	3.50
Thu.	7	12.20 AM FQ	3.50
Fri.	8	12.50	3.50
Sat.	9	1.20	3.50
Sun.	10	1.50	3.50
Mon.	11	2.10	3.50
Tue.	12	2.40	3.50
Wed.	13	3.10	3.50
Thu.	14	No L.	No L.
Fri.	15	No L FM	No L.
Sat.	16	No L.	No L.
Sun.	17	7.40 PM	10.00 PM
Mon.	18	7.40	11.10
Tue.	19	7.40	12.10 AM
Wed.	20	7.40	1.00
Thu.	21	7.40	1.40
Fri.	22	7.40 LQ	2.20
Sat.	23	7.40	2.50
Sun.	24	7.50	3.20
Mon.	25	7.50	3.40
Tue.	26	7.50	3.40
Wed.	27	7.50	3.40
Thu.	28	7.50	3.40
Fri.	29	7.50 NM	3.40
Sat.	30	7.50	3.40
Sun.	31	7.50	3.30

TOTAL HOURS DURING 1908.

By Table No. 1.

	Hrs.Min.
January	228.30
February	187.30
March	192.00
April	160.10
May	155.10
June	138.00
July	155.50
August	173.40
September	185.20
October	214.00
November	218.10
December	226.40
Total, yr.	2235.00



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10-Candle Power.

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This lamp is a perfect substitute for the 10-candle Pentane Lamp hitherto used, and has the following advantages:

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2d. It is remarkably steady. Will burn 24 hours continuously with less than 2 per cent. variation.

3d. It is much less dangerous than Pentane, which is a kind of gasolene.

4th. It is not easily affected by air currents in the photometer room.

5th. Since the lamp may burn continuously, the candle power of gas may be taken at any moment, if necessary. This insures steady illuminating power without waste of carburetting material.

6th. The first cost of the lamp brings it within the reach of even small gas works.

7th. Costs much less to maintain than a Pentane lamp or sperm candles doing the same service.

8th. Is not affected by the weather.

PUBLIC LIGHTING TABLE.

MAY, 1908.

Day of Week.	Date.	Table No. 2. NEW YORK CITY. ALL NIGHT LIGHTING. Complete Lighting in One Hour From Time Given P. M.	Complete Extinguishing in 50 Minutes From Time Given A. M.
Fri.	1	6.47	3.52
Sat.	2	6.47	3.52
Sun.	3	6.47	3.52
Mon.	4	6.47	3.52
Tue.	5	6.47	3.52
Wed.	6	6.47	3.52
Thu.	7	6.57	3.42
Fri.	8	6.57	3.42
Sat.	9	6.57	3.42
Sun.	10	6.57	3.42
Mon.	11	6.57	3.37
Tue.	12	6.57	3.37
Wed.	13	6.57	3.37
Thu.	14	7.07	3.27
Fri.	15	7.07	3.27
Sat.	16	7.07	3.27
Sun.	17	7.07	3.27
Mon.	18	7.07	3.27
Tue.	19	7.07	3.27
Wed.	20	7.07	3.27
Thu.	21	7.12	3.22
Fri.	22	7.12	3.22
Sat.	23	7.12	3.22
Sun.	24	7.12	3.22
Mon.	25	7.12	3.22
Tue.	26	7.12	3.22
Wed.	27	7.12	3.22
Thu.	28	7.12	3.17
Fri.	29	7.12	3.17
Sat.	30	7.12	3.17
Sun.	31	7.12	3.17

TOTAL HOURS DURING 1908.

	Hrs.Min.
January	481.50
February	329.15
March	351.50
April	341.50
May	233.05
June	218.10
July	282.55
August	254.55
September	292.25
October	420.45
November	374.30
December	411.05
	3992.35
Deduct on account of 50 min. extinguishing time	30.30
Total, yr.	3962.05

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...OF AMERICA....

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Mexico, Mo.
Jacksonville, Fla.
Syracuse, N. Y. (2d contract).
Atlanta, Ga. (2d contract).
Holyoke, Mass.
Peoria, Ills.
Schenectady, N. Y. (2d contract).
Danbury, Conn.
Galveston, Tex. (2d contract).
Quebec, Canada.
Indianapolis, Ind. (2d contract).
Bessemer, Ala.
Waterbury, Conn. (5th contract).
Sioux Falls, S. D. (3d contract).
Philadelphia, Pa.
New Hartford, Conn.
Poughkeepsie, N.Y. (2d contract).
Nashville, Tenn.
Salisbury, Md.
Norfolk, Va. (4th contract).
Wallingford, Conn.
Richmond, Va. (2d contract).
Oak Bluffs, Mass.
Arlington, Mass.

TOTAL SETS INSTALLED DURING YEAR, ... 43
TOTAL SETS INSTALLED TO DECEMBER 31, 1907, ... 677
TOTAL DAILY CAPACITY, TO DECEMBER 31, 1907, ... 545,865,000 cu. ft.

Tar Extractors for Carburetted Water Gas.
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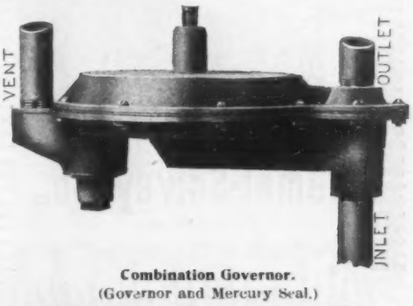

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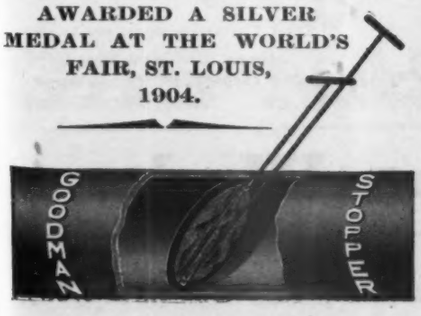

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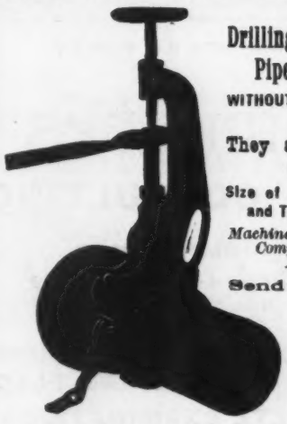

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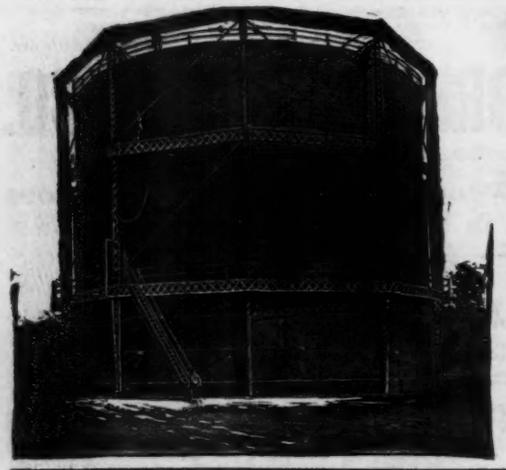

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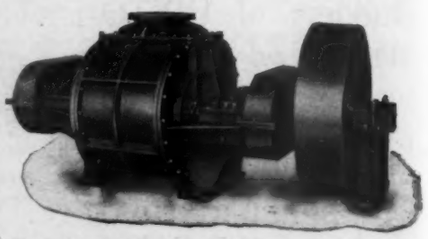

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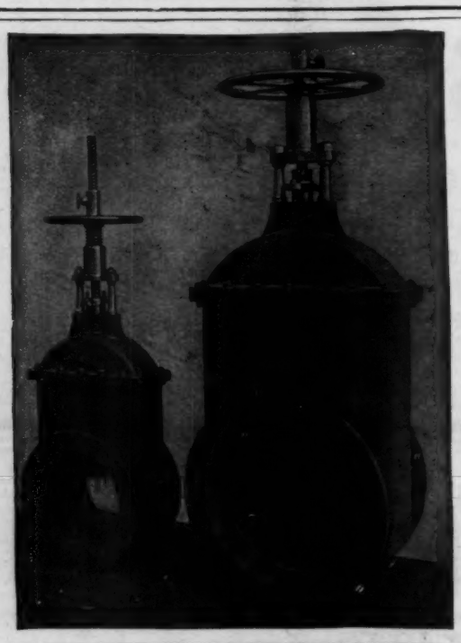

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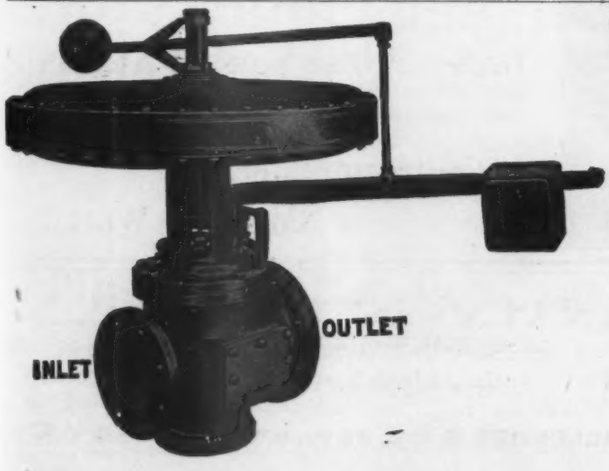

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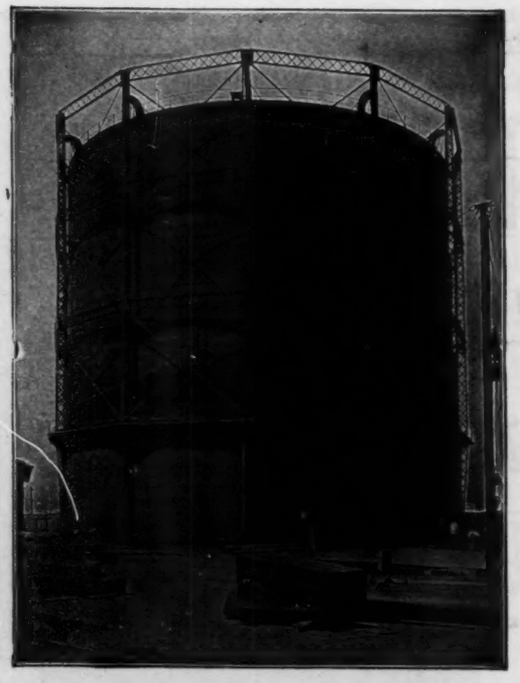

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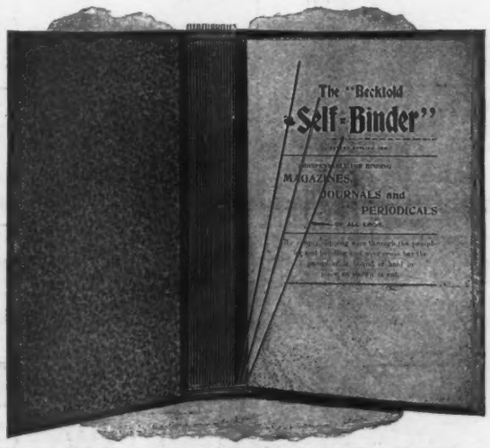

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